TECHNOLOGY DEPARTMENT

approach

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OCTOBER 1959

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A BACKWARD LOOK IS OKAY...

. . . but a look ahead can be much more productive and rewarding. Especially when it's a look ahead at the coming winter months and their effect upon flight operations. Even a good aerology forecast doesn't allow enough time to start wondering where the snowplows were stored after last year's snowfall. Here's a forecast you can start taking action on right now: This winter there *will* be winter flying and operating conditions. Take a quick look backward at last year—if you were fully prepared for every winter condition that arose, have a bouquet. And if you were or not, take a look in the opposite direction and start planning and acting NOW for the winter that's certain to come.

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RADM William O. Burch, Jr.
Commander, Naval Aviation Safety Center

CDR Herman Evans, Jr.
Head, Literature Department

Editor, A. B. Young, Jr.

Managing Editor, LCDR W. J. Thomas

Associate Editors:
LCDR J. M. Wondergem; LCDR D. M. Hume; LT W. B. Kennedy; J. T. LeBarron, JOC; J. C. Kiriluk; Julia Bristow

Art Director, R. B. Trotter

Illustrator, T. W. Healy, ALC

Photographer: J. E. Williams, Ph 1

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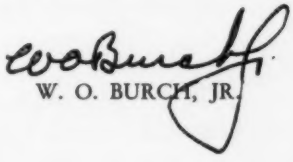
FISCAL YEAR 1959

is history and the navy aircraft accident rate has again reached a record low figure. We take this opportunity to examine our accomplishments with pride and to list our failures with new determination.

The Annual CNO Aviation Safety Awards are emblematic of outstanding achievements in the total field of aviation. They reflect the special efforts of all the members of the honored units; efforts in devising and employing improved maintenance techniques; efforts in refining the aviator's art and efforts in fusing individuals into an effective team.

I extend congratulations and earnest thanks to the recipients of the 1959 CNO Aviation Safety Awards.



W. O. BURCH, JR.

ComNavAirLant

WINNERS

VMF(AW) 114
F4D

VF-14
F3H

VA-35
AD

VA-106
A4D

VAH-5
A3D

VP-5
P2V

VP-49
P5M

VS-27
S2F

HS-7
HSS

VMT-1
F9F-8T/B, TV

FASRON 3
11 Models (Props & Jets)

ZW-1
ZPG, SNB

Honorable Mention

VF-74
VF-101
VA-15
VA-36
VAH-9
VX-1
FASRON 102
VP-10
VR-1
VW-4
HS-3

CNAResTra

WINNERS

VF-727
F9F
NAS, Glenview, Ill.

VMF-218
FJ
NAS, Willow Grove, Pa.

VA-672
AD
NAS, Atlanta, Ga.

VP-741
P2V
NARTU, Jacksonville, Fla

VS-861
S2F
NARTU, Norfolk, Va.

VR-822
R4D
NAS, New Orleans, La.

HU-751
HUP
NARTU, Lakehurst, N. J.

Honorable Mention

VF-771
VMF-112
VMA-233
VP-742
VS-663
VR-873
HU-732
ZP-752

ComNavAirPac

WINNERS

VF-124
F8U, TV, F9F

VF-193
F3H

VA-152
AD

VA-155
AD/A4D

VAH-6
A3D

VP-22
P2V

VR-21
R6D/TF

VW-12
WV/R7V

HMR(L)-361
HUS/HRS

VU-7
JD/FJ

FASRON-117
SNB/TV/TF

Honorable Mention

VF-121
VFP-61
VA-145
VA-126

VAH-4
VP-9
VP-47

VS-38
HU-1
VMT-2
FASRON-4

CNATra

WINNERS

ATU-501
P2V/P5M

BTG-9
T2V

BTG-3
T-28

CIC Officer: School, NAS Glynco, Ga.
F2H/WV

Honorable Mention

ATU-301
BTG-7
BTG-2

Special Award

USS THETIS BAY
Helicopters
ComNavAirPac

the WORLD SERIES

of naval aviation

JUST as a good season often brings a team to the World Series, so a good year of operation brings many a Navy squadron to the top of its respective type league . . .

Nomination for the Annual Chief of Naval Operations Aviation Safety Award is truly an honor; and an accomplishment paralleling that of World Series participation.

The national pastime champs have a way of doing it. To be sure it's the result of moments of brilliant individual play, and to a certain extent of the breaks; but the consistent winners of the season have an extra something—you can't really put your finger on it and say what it is. It's just overall excellence in performing the total mission together—as a team!

APPROACH has reviewed the reports of the winners and nominees and selected the following excerpts. These tips from the dugouts of the champs are passed along in the hope that they may help improve the state of the art of safe flying.

The squadron has employed for some time a series of short review lectures on aircraft systems, squadron SOP, emergency procedures and similar items related to aviation safety. These are presented at daily pilot meetings.

The aviation safety officer enjoys full cooperation from the commanding officer and other senior aviators in matters pertaining to safety.

SPN-12 tapes are brought to the readyroom after the recovery and each landing is analyzed and talked over by the pilot, the LSO and the senior naval aviator in Pri-Fly. Any unsafe tendencies are quickly discovered and brought to the pilot's attention in this manner.

A squadron pilot is assigned to CIC and CCA during all flights at night or under instrument conditions. His job is to monitor the flights at all times and to provide on the spot liaison with the CIC and CCA controllers.—*VMF(AW)-114*

A high power turn-up and test flight is mandatory after maintenance which requires the breaking of fuel and hydraulic line integrity.—VF-14

Intensity of supervision of landings and takeoffs by familiarization officers and runway duty officers.

Safety officer's surveys of personal flight gear, aircraft, unit spaces and shops, and maintenance and ground handling procedures.—*ATU-301*

The professional approach to aviation is maintained in HATRon SIX with constant training on emergency and standard operating procedures carried on throughout the year. Approach and landing techniques are closely monitored by the LSO and discussed daily with the pilots. HATRon SIX pilots use the angle of attack indicator as the primary instrument for airspeed control during approaches and this instrument is believed to have contributed greatly to precision in day and night carrier landings. Aboard ship day and night operations are conducted at every opportunity to ensure that pilot proficiency remains high.—*VAH-6*

A shop safety council was established utilizing senior petty officers from all squadron divisions, to promulgate and help establish safety doctrine.

Frequent meetings were held by the maintenance officer with all maintenance supervisory personnel. The commanding officer personally held a monthly meeting with all CPO supervisors to discuss Maintenance Safety and the continued improvement in supervisory procedures. This contributed directly to a record of only one in-flight emergency from lack of proper supervision in a total of 4800 hours flown while on the Kodiak deployment.—VP-22

Malast, W., AD1, USN, the maintenance line petty officer has been selected as the individual most instrumental in the establishment of the squadron's outstanding safety record. Other factors contributing to the Squadron's safety record were requirements of the commanding officer; the outstanding performance of the aircraft which can only be attributed to the safety attitude of the maintenance officer and the technical knowledge of his supervisors, and the pilots and maintenance personnel working together.—*VA-35*

New pilots reporting to the VF or VW divisions are given a thorough indoctrination in the aircraft to be flown. This includes a formalized ground school curriculum, comprehensive aircraft examination and, in the case of VF, the close personal supervision of an experienced "buddy" pilot. VF Operations publishes "The Word," a mimeographed sheet discussing safety and operational subjects. The VW Division has a program that presents a safety question of the week, instrument question of the week and emergency of the week. A parallel training program is conducted for maintenance personnel by division officers with emphasis on safe and proper line and shop procedures. Encouraged utilization of the runway emergency arresting gear by VF pilots during the reporting period has undoubtedly prevented several non-damage incidents from becoming AARs.—CIC School

---

Safety messages are published on the back of the daily flight schedule, weekly inspections of aircraft are conducted, periodic inspections of flight gear are made with emphasis on survival equipment, and safety displays are maintained. Safety movies are shown and periodic lectures are given to line crew and plane handling personnel. A "Plane Captain of the Week" program is conducted with the purpose of granting recognition for individual effort.

A new problem in pilot checkout presented itself here inasmuch as most of the newly designated aviators had never flown aircraft with conventional landing gear. A flight syllabus has now been placed in effect to insure a complete checkout for these pilots.

In addition to flying drill weekends and on cruise, the pilots have been urged to devote extra days, evenings, and weekends to flying, thereby increasing their knowledge of their aircraft, their pilot proficiency and in the final analysis, their safety.

All squadron pilots are not only instrument qualified, but utilize and better this knowledge by cross-country flights on their own time. During the year flights were made in single and section units to diverse points.

Complete preflight briefings are mandatory and adhered to in VF 771, covering all elements and safety features of a flight. De-briefing discussions are also held after hops as a valuable aid to better flight safety.—*VF-771*

Primary reason for the squadron safety record was close personal supervision by experienced officers and petty officers in all departments including the outstanding performance of the squadron landing signal officers in their indoctrination of

pilots and working the aircraft on board ship . . . The Safe Flight angle of attack system contributed materially to the squadron's carrier landing safety record.—VAH-5

A periodic squadron Aviation Safety Bulletin is published.

A comprehensive "S2F Emergency Procedures Handbook" was compiled and edited in knee-board form and is used by all our pilots. Copies of this booklet were supplied to the pilots of the other NavAirPac VS squadrons and the Naval Aviation Safety Center. Our pilots underwent an emergency procedures syllabus in the S2F OFT, using the procedures outlined in the Handbook and following a syllabus set up by this squadron and the OFT crew.

Incoming safety literature receives rapid and thorough distribution through the use of strategically placed bulletin and periodical display boards.

A safety PDL Book is maintained and the suggestions placed therein have produced gratifying results. Several cockpit configuration changes were recommended in the book and were passed on to the Grumman representative.

A "Howgozit" chart, comparing our safety score with that of other NavAirPac VS squadrons, is kept up to date.

A system of scoring each pilot's carrier landings and then graphically representing his score was promulgated by NavAirPac just as this squadron left for its WestPac deployment. The competition engendered by this system was considered so beneficial that the squadron is maintaining a similar system to carry through this deployment and subsequent carrier qualifications. As an added incentive, a bottle of the pilot's favorite beverage is awarded to the "Ace-of-the-Month"—the pilot demonstrating the highest degree of carrier-landing proficiency during the award period.—*VS-38*

Command continuously supervised squadron personnel with major emphasis on safe maintenance, preflight and in-flight procedures and practices. Frequent and thorough safety conferences and discussion sessions were held between maintenance personnel, pilots, flight safety officer and commanding officer. The flight surgeon gave weekly aeromedical lectures. Weekly mandatory all pilots meetings were conducted by squadron operations officer covering operations requirements, procedures and performance.—VU-7

Last April a renewed emphasis was made by the Group Safety Officer to more fully utilize the knowledge and experience of our technical representatives. This program produced important items for the preflighting of our aircraft which previously had never been known. The cooperation and enthusiasm of these representatives contributed immensely to this Group's record.—*BTG-3 NAAS Whiting Field*

A "who-boo" program in which pilots report anonymously any possible unsafe practices they have experienced or observed has no doubt prevented similar recurrences of unsafe practices and possibly has prevented additional accidents.—VA-106

In the belief that a good safety record is often its own worst enemy by inviting complacency, an aggressive and relentless accident-prevention program was continuously pursued. The door was kept closed to the "It - can't - happen - to - me" feeling. Safety in flight and ground handling operations were never allowed to stagnate.

Direct access to the commanding officer and heads of department by the safety officer was an actual fact, not a paper-work arrangement designed for administrative inspections. The commanding officer took an active part in the safety program by publicly and enthusiastically proclaiming his endorsement of accident - prevention measures.

The commanding officer, operations and safety officer attended the carrier's monthly safety meetings even when not embarked.

The safety officer found a way to reach all hands with timely and pertinent safety material by publishing informal monthly handouts, one edited especially for the enlisted maintenance personnel and one aimed to attract the attention of the pilots.—*HS-7*

Although it is no longer required, the squadron still uses a Monday morning instructors' weekly aircraft inspection. In several instances this method caught discrepancies which would have undoubtedly otherwise resulted either in airborne aborts, unusual situations which would deny the completion of the mission, or emergency situations. Further it affords the instructors a needed "after-the-weekend re-fam" before becoming airborne. —VMT-1

A minimum of one 30-minute all-pilots safety briefing, by a MARTD pilot, each day prior to flight. These briefings cover: local NOTAMs and operating procedures, excerpts from NASC "Weekly Summary of Major Aircraft Accidents," appropriate items from NASC "Crossfeed" and a review of FJ accidents briefs taken from the NASC FJ Analyst's letters to the Aviation Safety Officer.

First flight of each weekend restricted to two plane sections flying fam and simulated instrument type flights.—VMF-218

The accident-free operations of this squadron were achieved by the cooperation and effort of all hands aboard this station and a maximum effort on the part of all squadron personnel. During the annual two-week training duty conducted at U. S. Naval Air Station, Key West, operation SLAMEX, and throughout the year this squadron has operated in all weather conditions encompassing all phases of antisubmarine training. To participate in the type of operations cited above and maintain an accident-free record requires a vigorous program to keep all personnel constantly safety conscious. Some of the methods employed to accomplish this are as follows:

a. Prior to the first flight each drill weekend, the squadron safety officer briefs all pilots and crewmembers on all changes to safety regulations pertaining both to flight and ground safety.

b. Safety of flight, hazards to be encountered and a review of emergency procedures are incorporated into each preflight briefing.

c. All maintenance and line personnel are instructed in safety procedures by the safety officer and maintenance department.—*VS-861*

HU-751 has accomplished an accident-free record for the fiscal year through an intensive flight safety education program involving all hands and personally supervised by the commanding officer. This program included scheduled flight safety lectures and briefs prior to flight operations covering specific emergency procedures; review of current NavAvSafCen pubs as applicable; flight operation lectures concerning rotary wing flights with emphasis on accident prevention; preflight, post-flight and ground handling techniques; periodic emergency drills covering specific emergency situations conducted by each flight crew.—HU-751

Two safety log books are maintained on a daily basis; one in the line maintenance office for use by the line and trouble-shooting crews, the other in the maintenance office for use by the hangar and night check chiefs. Entries are made as to any unusual occurrences, and are reviewed by the maintenance officer and the safety officer. The aircraft parking ramp has a daily walkdown to prevent foreign object damage.—*VA-36*

This squadron emphasized all standard means of promoting safety such as an intensive training syllabus for pilots, thorough preflight briefings, safety lectures, operational flight trainers and periodic review of doctrine and procedures by the flight standardization board.

All flight briefings were supervised by an operations duty officer, a senior pilot who has the responsibility to cover in addition to those items provided in a standard briefing, e.g., (doctrine and weather) any specific and/or new safety information that may be pertinent to the mission.

The level readiness concept which provides a steady input of new pilots into the squadron permitting their orderly and thorough training upon arrival and the high level of training attained by pilots prior to reporting aboard from the training command are considered to have had a significant influence on the safety record.—*VS-27*

Within the maintenance department there is a maintenance safety board consisting of the maintenance safety officer and a designated senior petty officer from each division. This board meets biweekly when shore based and during each in port period when carrier based for discussion of past policies, procedures, or practices which may be conducive to unsafe conditions. These conditions and possible corrections or recommendations are recorded and published after each meeting.

The greatest result of this council is the consciousness that pilot airborne safety rests absolutely on the broad base of ground maintenance with each man playing a vital role. The procedure not only produces specific recommendations but even more important it creates an environment and atmosphere which invites spontaneous participation and initiative by all hands.—*VA-15*

TO THE ACCIDENT-FREE

A large number of fleet and reserve squadrons flew the entire FY 1959 without a serious accident — in fact the number was so great that security prevents such a nearly complete listing of the Navy's air inventory.

But we can say that there were 319, thirty-nine more than last year! To these units, WELL DONE! Shortly you will be receiving the appropriate accident-free insignia.

. . AND SOMETHING FOR THE LOSERS

"The tumult and the shouting dies." Another fiscal flail is past. The victors have been ceremoniously coronated midst suitable pomp and pageantry. What about the also-rans?

CNO Aviation Safety Awards and Admiral James H. Flatley Awards and "E's" have been won. The winners have been recognized and rewarded and so it should be. Their records benefit the entire Navy and, indeed, the entire nation. All the praise we can heap upon them is none too much.

Now it is the loser's turn to come in for a little encouragement too; 319 units flew accident free and this includes many who missed the big awards. Some units had one or two or perhaps more accidents but who can say that their investigations and reports were not so well done and timely as to keep one of the winners from having a similar mishap? Maybe we learn more from the losers than from the winners. It is certainly easier to analyze and explain how we had an accident than how we prevented one. If the exchange of ideas at a safety council meeting were as tangible as the hardware in a jet hole, the aviation safety business would be a snap.

Please don't get the notion that it would be a big help if everyone would charge out and have a lot more accidents just to beef up the IBM files. The point is, if an accident does occur, the feeling of total loss can be overcome to some degree by making the accident pay in terms of knowledge and prevention. So the loser is a contributor too.

Losers can go in either of two directions. They can lie down and moan and wish it hadn't happened and hope it doesn't happen again. Or, they can wade in with both feet, get the maximum info out of the one that did happen and see to it that it doesn't happen again to themselves nor to any other outfit.

Winners or losers, there is one common objective; fewer and fewer and fewer aircraft accidents. So, while we are giving the boys on top a well-deserved whack on the back, let's give the guys who are down a hand up and not a kick in the teeth. ●

Monitor

EXCERPTS FROM SOME OF THE NAVY'S SAFETY COUNCILS THROUGHOUT THE WORLD, WHO PROVIDE LOCAL LEADERSHIP AND EMPHASIS TO THE NAVAL AVIATION SAFETY PROGRAM.

Two main trends are in evidence in recent accident history. The pilot factor has gone down to 45% and the material factor has gone up rapidly. On the Washington level, increased liaison between BuAer and BuPers to ensure a more stable personnel situation to fit the need is being actively pursued.

The undetermined factor is going steadily upward due to the higher percentage of high performance aircraft now in use throughout the Navy. The area of carrier aviation needs increased emphasis safety-wise. Too much pressure is being brought to bear in the area of landing intervals and a general rush-rush attitude prevails. This, in conjunction with an extremely limited area of space available to the aircraft assigned to the 27-Charlie carriers, has led to an increased carrier accident rate.

The biggest area for improvement is the ground accident situation. Inadequate supervision combined with inexperienced and poorly trained personnel can only lead to disaster. By examining the safety record, it is found that ground accidents alone cost the Navy $4,000,000 last year. Supervision must begin at the top, and without continuous command attention being placed on ensuring that a thoroughgoing safety education program is actively carried out, the accident rate will continue to go up.

When ground accidents do occur adequate punishment commensurate with the offense must be administered to discourage further laxity in supervision. Since 60 percent of all ground accidents were caused by non-rated men last year, the lack of supervision is apparent.

The work of the Area Safety Councils was complimented. By reviewing the minutes of the various councils one could ascertain how conscientious each area was in handling their safety problems.—*Alameda Area*

Cold and Clammy

WINTERS come and go with their ice-filled clouds and freezing temperatures, but I shall always remember my ride last winter as a passenger in an SNB. It was a return trip from a midwest NAS back to the East Coast and for me the hazards greatly outweighed any compensating pay. The co-pilot for this leg was a friend with whom I had flown previously. On the left was a pilot whose abilities I had begun to question on the trip out. The other passenger was a young maintenance type on his second military hop.

Scattered thunder showers were forecast for the mountains and we were assigned 8000 feet on an IFR flight plan. On engine runup the port engine had a 150 mag drop and the pilot tried to burn it out without success. Takeoff and climb were uneventful but shortly after the second reporting point we went into the clouds; the scattered had thickened into broken to overcast. Carb ice and structural ice was encountered. The airspeed dropped and the starboard engine began missing. To hold airspeed and altitude the pilot used full rich and full throttle. Only after heavy coughing on both engines and insistence by the copilot did the pilot use alternate air. A clearance for higher altitude came through and at an indicated 75 to 80 knots the *Beech* strained upward.

About this time the other passenger leaned over and asked if we were in any real trouble. I explained the situation to the best of my ability and tried to assure him we were still safe (though I wasn't too sure of it myself). A minute later he exclaimed, "I think the starboard wing is on fire!" I looked, and with the reflected glare from the clouds the blue and red flame of the exhaust from a rich mixture did look frightening, even to me. It was then I double-checked my harness and chute.

The starboard engine lost power to 12 inches manifold pressure and rather than stall, the pilot pushed

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Forms for writing Anymouse Reports and mailing envelopes are available in ready-rooms and line shacks. All reports are considered for appropriate action.

— SUBMIT AN INCIDENT, PREVENT AN ACCIDENT —

her over and the altimeter dropped rapidly. We were in designated mountainous terrain and my eyes were glued to all the instruments within my vision. Then grey hairs sprouted with the loud silence of two dead engines.

The pilots had kept their attention on the icing, altitude, and flight instruments but they had completely disregarded the fuel supply.

After 1000 feet of altitude went by, the iced engines coughed to life again. Not enough time to receive a clearance so the copilot broadcast our present altitude as 5000 feet.

The next few minutes I watched with fascination as the two nearly panicked pilots worked to keep the aircraft airborne. Not until north of Richmond, Virginia and below a now scattered layer at 1500 feet altitude did the aircraft recover normal operation. With the help of a DF steer we arrived over our home field. From the chocks I departed for a tension-relieving hot shower and some very strong refreshments for my personal deicing.

PREOCCUPIED

OUR flight of two FJ-4s was cleared to break and enter the downwind leg ahead of a *Beechcraft* which was already on downwind. The leader broke and I followed him, cutting back to idle power to stay behind. Although the SNB and I arrived at the 180 position at the same time I passed about 200 feet below and he extended his downwind.

I kept my eye on the SNB and dropped the flaps. Turning on base the gear indicators were checked and they were all the same so I made the usual call to the tower. They didn't answer and at the 90 spot I called again. This time the clearance to land came back; however I couldn't get the bird slowed up to land. I rechecked speed brakes "out" and flaps "down." They were all right but then at the 45-degree position I heard "second FJ . . . " and I knew the awful truth before the tower finished the transmission. No gear.

I took a waveoff and made a normal landing on the next pass. Only my pride was damaged on this incident. It was the old deal of having your chain of thought interrupted, keeping a wary eye on the SNB in this case.

GATE CRASHER

IT WAS night and I was flying an R4Y on an instrument flight plan. We were cruising westbound at assigned altitude of 10,000 feet from Las Vegas to Daggett. Reaching Clark Intersection I was cleared by LA Center direct to Hector Omni, then V-21 to Ontario and Long Beach.

Three minutes out from Hector I spotted lights dead ahead; range, about five miles, closing. I started a slow turn to the right but the lights of the other aircraft turned into me. I can only assume that he was making a course correction to boresight Hector omni.

Time in which to do something was vanishing. To avoid a head on collision I cut both engines, dove to 9500 feet, and let a perfect silhouette of a P2V slide directly over me. ATC knew of no P2V in this area but the main thing is this: At 10,000 feet we were in and out of clouds with visibility about 8 miles in the open areas.

What do pilots think about on a dark night when they're churning through clouds along airways on a VFR flight plan? There's a nagging thought in the back of my mind now. On solid instruments how many sneakers are at 500 feet above or below me?

Tighten up those instrument written exams so at least violators can't plead ignorance.

SKIMP ON

JUST recently I was flying an HRS-3 as a plane commander in a vertical assault demonstration at NAS Oceana. Our flight of 12 helicopters had just completed a troop landing demonstration and we were waiting for the next event having landed in a large open field behind the reviewing stands.

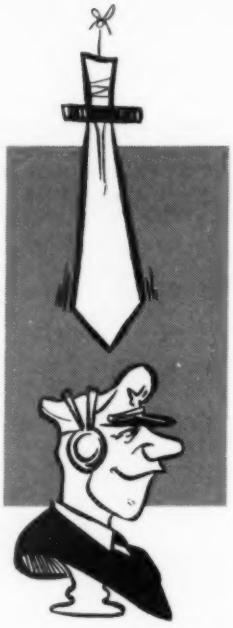
I gave the control of the helo to the copilot without audibly informing him I was switching from forward to aft fuel tank. The aft tank was low in quantity but I wished to save the forward tank for the events to follow.

On signal from the flight leader the copilot took off, picked up the external load and rendezvoused with the remainder of the flight. The leader took the flight out to sea, made a 180 turn and passed over the beach in front of the reviewing stand to simulate resupply of the troops from an aircraft carrier.

At this time I looked at the aft tank warning light, thinking to myself that it must be getting pretty low since I had switched to it several times that morning when on the deck. My eyes went from the red warning light to the fuel selector, which to my horror, I had left on the aft tank position. The fuel gage indicated a big fat zero pounds remaining.

I rapidly switched tanks and at no time did the engine cut out but later I found I had between 0-25 pounds which meant 0-6 minutes time remaining in the aft tank when I switched.

Needless to say a more thorough takeoff check list should have been accomplished. It is my belief that helo pilots are more apt to skimp on check lists as usually they make more landings per hour than fixed wing types do. After the first few landings a helicopter pilot is inclined to believe that everything in the cockpit will remain the same. This, as you can see, is not always the case.



BRUSH WITH BRUSH

AFTER the engine was turned up a standard Navy issue wire brush, about 18 inches long, was found delicately balanced just forward of the prop governor of the port engine!

How three supposedly competent people could miss something so obvious and potentially dangerous is a testimony to complacency. The plane captain failed to spot it during his preflight. The copilot missed it on his walk-around inspection and the pilot (me) started the engine with the wire brush in plain view.

After the engine had been turning about two minutes the plane captain finally noticed it and gave me an emergency cut signal. The offending object was removed without further incident, but I'm firmly convinced that the first time the brakes were applied, the brush would have fallen forward into the prop blades with possible messy results.

CHOKED UP

AFTER ferrying an S2F which was just out of overhaul (it was accepted from a FASron) we landed and discovered that the carburetor intake on the starboard engine was taped over with a fabric type masking tape. The tape had apparently parted when the engine was started—enough to allow almost full power on turnup and on takeoff (53" vs. 56" ideally).

Two pilots missed the taped over intake. The plane commander (me) personally inspected all the rocker boxes, governors, prop domes. FASron personnel who preflighted the aircraft missed it. O&R people who did the taping missed it.

In color the tape was a dark khaki and has a high break strength. The discovery was made by a mech walking toward the aircraft after we had pulled up to the squadron line. Three out of four pilots questioned did not even know which of the intakes on the front of the engine were for the carburetor.

It could easily be missed again!

Instead of khaki tape, how about a high visibility red for such jobs?

Who did it happen to? The aviation safety officer (me again) of the squadron.

LOST LEAD

THIS happened in the advanced training command during a cross-country in F9F-8Ts. I was in the back seat (student) with the instructor in front flying wing on another F9F-8T.

We commenced a section penetration and after entering the soup about 5000 feet the pilot up front lost sight on the lead aircraft. He continued on course (good midair material) until he finally decided he had really lost the leader. Then he called and told lead we were climbing back on top.

Obviously he didn't go on instruments. Thinking he was pulling straight up we actually rolled to 120 degrees of bank and the nose went 20 degrees below the horizon. Altitude at this time was about 2500 feet.

I hesitated to say anything (student reluctance, you understand) and seconds later we broke out under the clouds at less than a thousand feet altitude. The instructor snapped the plane level. He was speechless but the gasping over the intercom led me to believe he too was "shook." He immediately called for a DF steer and between the efforts of approach control and Tacan, we were brought back safely to the field. The low fuel light was on before we were in the pattern.

Recommendations? Of course. The flight was not properly briefed for procedure in case of loss of lead during penetration. The wingman should have taken immediate action to avoid a midair when he lost sight of the leader.

The pilot should have promptly shifted to instruments to prevent unusual attitude, vertigo, . . .

The student should have at least said something when the steep bank was not immediately corrected.

WOW!

BEING an experienced TV-2 pilot, I consented to fly a service flight for another command. After 30 minutes of flight, I was forced to land because the leading edge cap gasket was worn and all the fuel was being siphoned overboard via the faulty cap. With a new cap and full load of fuel I leaped off into a solo IFR flight.

After an IFR, radar controlled climb, I was released on course in the soup at flight level 290, somewhere between the first and second checkpoint. Due to a thunderstorm close aboard my course I was unable to set a reliable correction for the wind which was predicted to be 260 degrees at 65 knots. Prior to reaching the first fix after radar released me, the ADF went out.

A quick call to Center and I was fixed up with a block altitude and instructions to call radar on channel 10. I soon discovered that channel 10 was set on the wrong frequency. In fact I couldn't reach anyone on any frequency now except Center.

It was getting dark and I turned on the cockpit lights only to find out they didn't work. Anyway they were fluorescent floodlights and for me these are unsatisfactory for night IFR. About this time Center said to squawk emergency IFF so I did. Upon breaking out the duty flashlight I found that the batteries were burned out. Taking the light from my life vest I found this battery was burned out too. In the soup, at night, without lights . . . it just can't be done, and it was getting darker every minute. I could hardly see the attitude gyro.

When I informed Center of my plight and asked to be brought below the overcast they said no one could read my "Mayday" squawk but they told me to turn to 320 degrees and contact McGuire Approach Control on Guard.

I couldn't contact McGuire.

Knowing that I had to see those instruments it was time for something drastic. I turned off the wing tank transfer and let the fuel level low warning light come ON. Then I took off the red lens and held the bulb. It lit up the cockpit brightly but I could see enough instruments to maintain IFR flight.

Since Center was the only ground station I could read they continued with instructions. They gave me a descent to 22M and asked me to make a 360 right turn. I was glad to do it as I had plenty of fuel and this gave me an opportunity to trim neutral (giving me a green light), put on 70 percent, drop speed brakes and descend without worrying about airspeed. A glance at the fuel quantity showed 20 gallons in the fuselage tank so I turned the wing transfer back ON.

Several turns, steers, and stairstep descents later, the Center told me to contact Suffolk County AFB on Guard. My destination was Quonset Point but Suffolk Co. sounded like a good port in a storm so I proceeded in to land, breaking into the clear about 8000 feet.

When safely in Base Operations I found that I was first located with DF cuts 100 miles out over the Atlantic Ocean. Seems the winds were actually from 310 at 160 knots.

As you can probably guess, a preflight equipment check is part of my routine these days!

PROBE and DROGUE

By CDR. L. HEYWORTH, Jr.

WE ALL know that in-flight refueling is not unduly difficult nor is it very hazardous. Nevertheless, there have been some 40 to 50 AARs and incidents brought about by this single operation in the past year.

After reviewing them, I was forced to conclude that there is a need for a better understanding among pilots of the factors which cause these numerous mishaps. I propose therefore to mention all the significant causal factors which have come to my attention and to lay down some recommended guide lines for dealing with them.

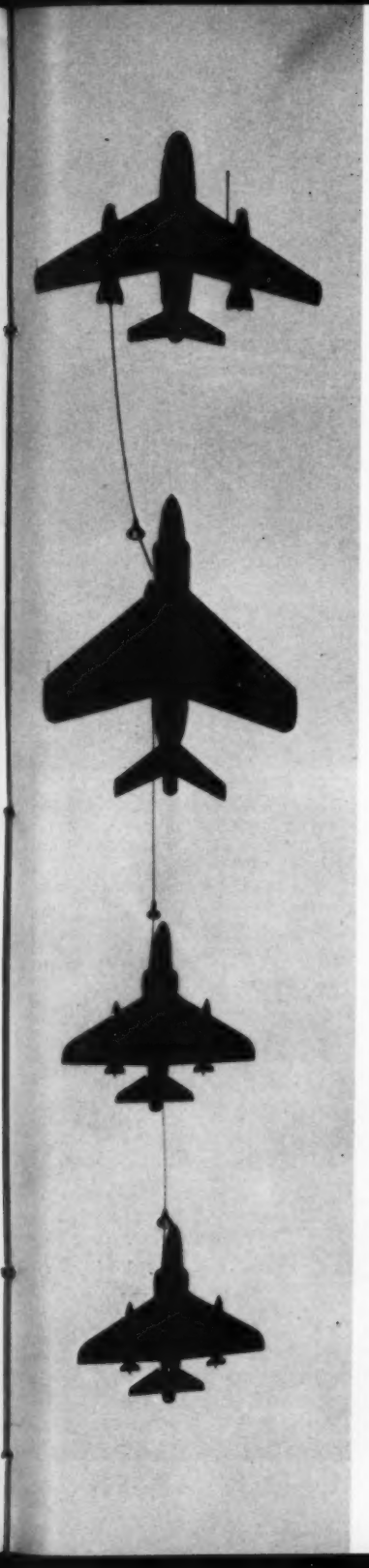
Main Causes of Trouble

First of all, the pilot preparing to qualify in in-flight refueling should be made aware of two basic facts which are not always apparent to the beginner. The first is that he will be flying in a turbulent environment caused by downwash from the tanker. Many pilots discover this for the first time on their first plug-in, and it is discouraging.

The second fact is that the drag on his aircraft will seem to increase abruptly just prior to plug-in. Many learners who do not realize this become victims of the common mistake of slowing to a walk about three feet aft of the drogue. The inevitable result is oscillation of the drogue from the receiver's "bow wave" effect. The next thing that usually happens is the "parry and thrust" type of maneuver in which a determined pilot gets involved while chasing the drogue. Very often this sets up a situation which can result in a fractured canopy and possibly a banged head.

After experiencing the above effects a pilot often concludes that the thing to do is grit his teeth and go charging in like a mad bull. If he engages the drogue with excess speed he will cause a large loop to form in the hose with consequent whipping. This whipping has been severe enough at times to break the hose off at the drogue-attach fitting, or to bend or break the probe.

If he misses the drogue—or even worse, catches just a piece of it followed by its slipping off the probe, he will overrun badly and obviously place himself in a position to be damaged by its violent oscillations. Excessive closing speed is sometimes developed without the pilot realizing it. This fault is most often caused by starting from too far aft, which allows the receiver to



accelerate for too long a period of time before reaching the point of plug-in. Guide lines for starting position will be mentioned later.

Withdrawing from a miss also has an optimum technique. So often a pilot tries to maneuever down, sideways, or both to avoid a missed drogue. Experience indicates that this causes greater likelihood of being struck than a straight-aft withdrawal with no maneuvering.

Oddly enough, there is one disadvantage to the centerline and near-centerline probe installations such as those of the F11F and A4D. Here the pilot can actually watch the probe go into the drogue. Sometimes the probe hits the funnel off-center about halfway in from the edge. When the pilot sees this he is very likely to try to salvage the run by quickly maneuvering the probe into the center. About 50 percent of the time he succeeds, but the other 50 percent is bad news. While attempting this cute save, he carries the drogue forward and puts some slack in the hose. Then if it slips off, the drogue is in an ideal position to lash out at him with unrestrained vengeance. The sound procedure here is to back off immediately if the engagement is abnormal in any respect.

There have been instances of damaged or cocked drogues oscillating unpredictably, so it follows that engagement should not be attempted if it is seen beforehand that the drogue's condition is abnormal.

The airspeed of the tanker is an important factor. If you stop to think about it, increasing the tanker speed will obviously decrease the retraction rate of the hose. There is some airspeed (unknown to me) above the optimum fueling speed at which the drag on the hose is exactly equal to the retracting force of the take-up reel. If an engagement were made at or above this speed, the hose would flail around like, but with considerably more authority than, a wet noodle.

Pilot fatigue is sometimes a serious factor. It is rather strenuous to fly for long periods in the tanker's downwash. If a pilot fails about three times to achieve a plug-in he is usually better off to move out to the side and relax for a short while. Often after such a brief rest he will come back in and succeed on his first try.

Two personal factors which have to be guarded against are pride and overaggressiveness. Pilots should be made to realize that everyone misses plug-ins (and sometimes several in a row). A pilot who gets over-zealous in his attempts to hook up, even when things are obviously snafu, can expect consequences which

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Cdr. Lawrence Heyworth Jr. is now CO of VA-81 which has A4D-2 aircraft. He has flown every type of carrier aircraft now operational in the fleet. Most of this valuable experience was gained in project flying with the Flight Test Division during two recent tours at NATC, Patuxent River. He is one of that rare breed of aviators who started their naval career as submariners. During WWII he made nine war patrols in the Pacific and was qualified for command of subs. Since becoming an aviator he has had three tours of squadron duty in addition to his Patuxent experience. He will shortly take command of his parent air group, CVG-8.

are much more serious than damaged pride.

Nothing has been said about design as a factor. It is definitely more difficult (though still feasible) to hook up with an off-center probe installation — of which the FJs are the worst example. I would not mention this except that in my research I noted that the greatest percentage of incidents and AARs involving in-flight refueling feature these off-center installations. The greatest number involved FJs, the next greatest F3Hs, followed by F8Us. The worst case I noted involved the loss of an F8U due to fuel exhaustion after numerous unsuccessful attempts to plug in to an A4D tanker.

We know that we have to live with certain design features along with everything else mentioned above, so the best action is to establish some sound procedures for guide lines which will minimize the chances of mishap.

Above: In-flight refueling calls for skillful flying, but there's nothing hazardous about the process if pilots are well trained and briefed on what to expect.

Right: *Demon's* probe, like F8U, is retractable. Receiver aircraft must compensate for added weight as fuel is taken on, as tanker adjusts for lightening load.

Below: In-flight refueling store is self-contained unit. The prop drives a ram air turbine. If drogue is lost or hose is severed, hose will automatically rewind.

Recommended Guide Lines

Just as in any other evolution in aviation, the basic consideration should be controlling those conditions which can be controlled.

► First of all, avoid rough air, if possible, by wise choice of altitude and locale for in-flight refueling.

► Use the recommended optimum speed for in-flight refueling. This provides a reasonable compromise among the various considerations of hose-whip, downwash turbulence, and controllability. The best speed is usually 230-250 knots.

► Take a precise initial position which is close enough to the drogue to be in its same environment. This position is usually described as having the probe from 10 to 20 feet directly behind the drogue. Settling down in this position allows the pilot to stabilize speed accurately, to get proper alignment with his reference points, and to trim out the trim changes caused by downwash. The trim changes are considerable — especially lateral trim change in the off-center installations. The position recommended, being close behind the drogue, reduces the possibility of generating too great a closing rate at engagement.

► Add a prescribed amount of power (which should be squadron doctrine) for the run-in. For most airplanes this power increment is about 5% rpm.

► Close on the drogue using *only* your reference points on the tanker. Sneaking a look at the drogue during the run-in will only foul you up, particularly with the off-center installations. You can usually see the drogue well enough out of the corner of your eye to tell whether you have hit or missed at the "moment of truth."

► If you have missed, back out deliberately, still in line with your reference points. Set up your starting position precisely as before and repeat the above procedure.

► When you get your plug-in, carry the hose forward about 10 feet so that if you slide aft a bit during the fueling you will not inadvertently unplug.

►While fuel transfer is proceeding, the tanker pilot should be alert for the need of slight power reductions to avoid increasing speed as his gross weight decreases. By the same token, the receiver pilot can expect a need for slight power increases as his weight builds up.

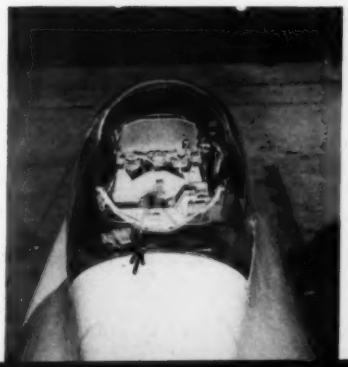
► In disengaging, back out, still in line with your reference points. Too many pilots have caused probe or drogue damage by a sloppy breakaway.

► As a guiding rule remember this. If it doesn't seem relatively easy, something is wrong. You are probably making too much work of it by being overtense.

► And finally, just as for any other precision maneuver, *practice*. Periodic re-quals of all pilots in the squadron should avoid any unfortunate incidents such as the loss of the F8U previously mentioned.

Night Refueling

Just a word about doing this at night. As in anything else, "It's exactly like daytime except you can't see what you're doing." With a little practice pilots become very good at it. Special lights of any kind are not considered necessary. The tanker's own fuselage lights illuminate the tanker sufficiently to allow the pilot to see his reference points for line-up. The receiver airplane's fuselage lights should be on BRIGHT and STEADY. In this condition they light up the drogue sufficiently for it to be easily seen from the recommended starting position.



A battered canopy resulted when the receiver aircraft's wing rammed the drogue. Distortion of the drogue caused it to oscillate, striking the canopy. When in trouble or in doubt, fall back, regroup and try again.

. . . the pilot felt an explosive rush of air from his lungs. . .

THAT bottle of soda you just bought is capped under pressure—and when you flip off the top, carbon dioxide forms bubbles in the liquid, giving your drink its fizz.

This same principle applies to the deep-sea diver brought to the surface too quickly, the tunnel worker or sand hog decompressed too rapidly, and the aviator exposed to reduced atmospheric pressure at high altitudes. In all three cases, gas, principally nitrogen, which is released from the blood and body liquids by the pressure drop forms bubbles producing the pains known as the "bends."

The bends is the major symptom of dysbarism, a term used in aviation medicine to cover all the physiological results of exposure to reduced barometric pressure independent of the effects of hypoxia. This exposure can be gradual, for instance, resulting from a faulty cabin pressurization system, or it can be instantaneous as in explosive decompression. Among the most frequent causes of the latter are spontaneous rupture of the aircraft canopy, inadvertent jettisoning of a hatch in flight, midair collision, enemy gunfire damage in wartime, and windshield or canopy damage from an inflight collision with a foreign object.

When explosive decompression takes place, the airman is physiologically shot to altitude at the rate of thousands of feet per second. In addition to the effects of dysbarism and hypoxia, further complicating factors are impaired vision from vapor, communications difficulties, cold and windblast.

The man best qualified to give you a sound medical briefing on dysbarism and related topics in layman's language is your flight surgeon. He will be glad to talk to you and your squadron on this subject. In the meantime, in the interest of promoting general discussion, APPROACH *presents the following cases from the Naval Aviation Safety Center's files:*

BUBBLES, BLOWOUTS and BENDS

Case 1: The LTJG executed a normal takeoff in an A4D-2 for a high level navigation hop. The first part of the flight involved an acceleration to high speed at low altitude, then a "zoom climb" to 37,000 feet. At 38,000 feet, the pilot reduced power and leveled out. At this point the aircraft's plexiglass canopy exploded and disintegrated instantaneously, leaving the windscreen intact. At the time of the explosion the cabin altitude was 22,000 feet.

As the pilot felt an explosive rush of air from his lungs, he felt as if his body and clothes had suddenly been blown up like a balloon. His oxygen mask was pulled away from his face and down beneath his chin. An estimated five seconds elapsed before he had the mask back in place. The pilot became slightly dizzy and caught himself hyperventilating, probably from excitement.

After the first momentary shock of decompression, the pilot immediately descended to lower altitudes in a high-speed dive with idle power and speed-brakes out. He slowed his rate of descent and leveled his wings at 12,000 feet. Replacing his earphone lead which had been disconnected in the explosion, he notified his wingman of the incident. At his wingman's suggestion, he retracted his speedbrakes and the two aircraft descended to 6000 feet. Their return to home base and landing were uneventful.

During descent, the pilot was conscious of a moderately severe pain in the middle of his chest. The pain gradually decreased as the flight continued and was mild at landing. Inside of an hour it had disappeared completely. He reported no other ill effects to the examining flight surgeon except for difficulty in clearing his ears. Examination 24 hours later showed no symptoms.

Investigation of the explosive decompression incident did not determine the cause. No apparent damage to the plexiglass canopy had been noted by pilot or plane captain before takeoff and no foreign objects were known to have struck the canopy during taxi, takeoff or climbout.

Case 2: A pilot of an F3H-2 was returning to a naval air station after a GCI Sidewinder hop. At about 24,000 feet altitude with the aircraft at .93 mach in a slight nose-down attitude, the port wind screen suddenly blew out with a loud explosion. (At 24,000 feet, the normal cabin pressurization would be 9000 feet in the F3H). The pilot reduced airspeed to 225 knots in order to transmit and receive. He later made an uneventful landing at home base.

At the time of the decompression, the pilot experienced an immediate pain in the forehead between the eyes. He had been flying with a cold which had caused considerable upper respiratory passage congestion. In the reporting flight surgeon's opinion, this condition was sufficient to obstruct frontal sinus drainage. The pain resulted from expansion of trapped gas in the sinus during the decompression.

Case 3: The top aft panel of the cockpit of an A3D-1 from a carrier ruptured at 44,800 feet leaving a 12" x 18" hole. Cabin altitude was 26,000 feet. Decompression was rapid. After an initial delay of one to two seconds due to a nose-up attitude following extension of the speed brakes, the aircraft began to descend approximately 10,000 feet per minute. At an altitude of 10,000 feet the aircraft flew a straight and level course.

The pilot had loosened his oxygen mask to take a drink of water prior to the decompression. When the decompression took place he thought at first due to the noise that there had been a midair collision. Then realizing what had happened, he im-

mediately refastened his oxygen mask. He reports being extremely cold; the ambient air temperature was about —55°C. He experienced no pulmonary symptoms or hypoxia.

Although the bombardier-navigator's oxygen mask had been firmly secured, the third crewman saw it fly away from the bombardier-navigator's face. The bombardier-navigator reached down and picked up the mask. As he lifted it to his face he lost consciousness. This took place about five seconds after the decompression.

The third crewman, who had experienced no difficulties, held the bombardier-navigator's mask to his face and applied intermittent positive pressure breathing. The man remained unconscious to an altitude of 25,000 feet. After regaining consciousness, he was poorly coordinated and experienced impaired mental activity for about 10 minutes. For a short time he suffered amnesia concerning all events in the 10-minute period prior to decompression. Later, he recalled the sudden intense pressure inside his mask and a sensation of his mask being torn from his face. On the following day the only after-effects he suffered were a severe headache for several hours and some anterior chest pain related to stretching motion but not to respiration.

Case 4: Shortly after the incident described in Case 3, an explosive decompression occurred to a second A3D-1 from the same carrier when an upper escape hatch opened at 41,300 feet when the emergency system was inadvertently actuated. Cabin altitude at the time was 24,000 feet. Decompression was instantaneous. The aircraft began to descend 6000 feet a minute until recovery at an altitude of 20,000 feet. Then the aircraft slowed sufficiently to permit closing the hatch and repressurization of the cabin. Then the pilot took the aircraft back to 40,000 feet.

The pilot experienced a gradual onset of steady but not severe pain in his left shoulder and elbow for a few minutes. The pain did not affect his ability to move his arm. On repressurization of the aircraft, the pain gradually subsided with only slight discomfort remaining after landing. The bombardier-navigator experienced mild discomfort in his ears on decompression and repressurization. Other than moderate anxiety, the bombardier-navigator observer had no ill effects. The third crewman had no physical difficulties. All the men reported being extremely cold; the temperature of the ambient air was about —55°C.

During the flight, the bombardier-navigator observer was walking freely about in the cabin in order to perform certain instrument readings. When the decompression took place he was directly under the escape hatch without safety restraints. He experienced no suction although he conceivably might have been swept through the hatch.

Case 5: The pilot and check pilot were on an instructor check flight in a T2V. Forty minutes after takeoff the canopy suddenly shattered at an altitude of 28,000 feet. Pieces of plexiglass struck both men on the face and hands. The pilot's helmet and oxygen mask were torn off and blown away. Flying plexiglass knocked the visor out of the check pilot's APH-5 helmet and cut two fingers of his left glove.

Both men went on 100% oxygen immediately, the pilot breathing directly from the oxygen hose. Proceeding to their destination, they landed without further incident. Neither man showed any after-effects other than the cuts and abrasions.

Case 6: As an A3D-1 was climbing to altitude, a 12" x 18" section of the panel assembly fractured and blew out causing the cabin to decompress rapidly. The bombardier-navigator's oxygen mask was torn from his face by the force of the decompression. After losing his oxygen mask, he became unconscious and did not revive until the pilot had descended to 25,000 feet. The pilot, third crewman and fourth crewman reported no difficulties. Findings of the medical examination of the bombardier-navigator after landing are not known. (Note striking similarity to Case 3).

Case 7: The navigator-bombardier of an A3D-2 pre-oxygenated for 10 minutes before takeoff. After takeoff the aircraft climbed to 33,000 feet in approximately 11 minutes, continued at that altitude for 15 minutes, then climbed to 37,000 feet. When the aircraft leveled off at 37,000 feet (cabin altitude was 33,000 feet), the crewman began to have pain in his right shoulder and right elbow and a prickling sensation as if ants were crawling over him. As his pain became progressively

"BENDS" pain from too great a pressure decrease—nitrogen bubbles form in your blood and body fluids
A BOTTLE OF SODA, A DEEP-SEA DIVER AND YOU!
BOTTLE IS CAPPED UNDER PRESSURE
IF DIVER IS BROUGHT UP TOO QUICKLY—
FLYER ASCENDS TO VERY HIGH ALTITUDE
CARBON DIOXIDE FORMS BUBBLES WHEN UNCAPPED
NITROGEN BUBBLES FORM WITH SUDDEN PRESSURE DROP
DECREASED PRESSURE FORMS BUBBLES—YOU HAVE "BENDS"

Diagram Courtesy of USAF Manual 52-13

more severe, he placed his oxygen regulator on safety pressure and began to breathe at twice his normal rate.

Because of weather conditions, the plane was forced to remain at 37,000 feet for approximately six minutes before it could descend. As the descent was made, the man's pain subsided at 25,000 feet cabin altitude. He was feeling quite well on landing; the examining flight surgeon found no after-effects. On investigation it was found that the cabin compressor was not functioning properly due to a leaking seal. During the flight the cabin was only about 4000 feet below the actual altitude.

Case 8: Forty minutes after takeoff on a routine flight from NAS Litchfield to NAS Dallas in a TV-2, the pilot began to notice pain in his shoulders and elbows. He had been at altitude 10 minutes—indicated altitude 42,000 feet, cabin altitude 30,000 feet. The pain increased in intensity and radiated into the biceps. A little over an hour after takeoff, the pilot experienced itching and burning sensations on his chest and stomach. At this time his face was flushed; he felt hot. For no apparent reason, he began to cough. Switching to 100% oxygen and safety pressure seemed to cause his cough to increase in severity. Meanwhile, he began to get very cold; he perspired profusely. He coughed so hard that he almost blew his oxygen mask off. Turning off the pressure breathing relieved his cough somewhat although he continued to cough slightly for the rest of the flight.

The pilot recognized the pain in his shoulders as "the bends" even though he had not experienced them before. However, thinking that the pain would dissipate, he elected to continue his flight. He failed to recognize the coughing and the sudden onset of burning sensations (as if ants were crawling over him) as further manifestations of dysbarism.

Hypoxia with visual disturbance and mental dulling came on after he began to cough violently. He experienced loss of peripheral vision which had progressed to tunnel vision prior to landing. The reporting flight surgeon theorizes that the pilot's coughing could have easily disrupted the mask-face relationship. The border of the mask liner was loose at the bottom and hence leakage could have occurred. During the flight, the pilot had illusions of being in a flat spin and "fish tailing" but used his instruments and by "talking to himself" was able to maintain course and heading.

The pilot flew over two jet airfields after the onset of dysbarism and prior to landing. He was able to make a normal landing at an Air Force Base in Texas, but when he tried to get out of the aircraft after taxiing in, he was too weak. In a state of shock, he needed help to stand after reaching the ground. After two days of hospitalization and an additional four days of grounding he recovered completely.

Investigation revealed that in order to conserve oxygen the pilot had not preoxygenated before takeoff. He used 100% oxygen for takeoff (not taxi) and switched to NORMAL at six to eight thousand feet.

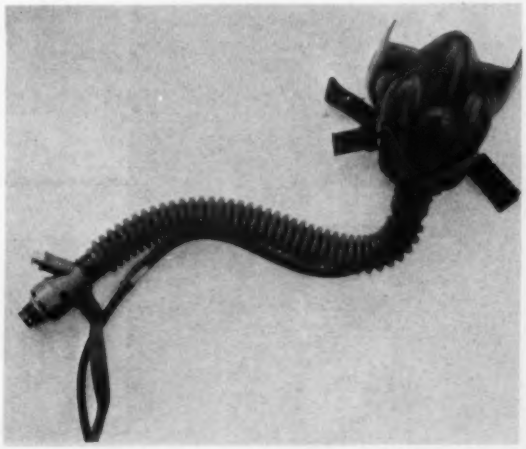
"The practice of using 100% oxygen only on takeoff is widespread among TV-2 pilots," the flight surgeon states. "This procedure has been followed since experience has taught that the limiting factor for range in the TV-2 with two pilots is oxygen rather than fuel. The pilot in this case was alone, but the possibility of habit pattern is strong here. The oxygen system was not full but there was an adequate amount present for one pilot to make this flight on 100% from takeoff to landing."

* * *

Your flight surgeon is the person in the best position to brief you on the causes, effects and treatment of dysbarism.

Generally speaking, the appearance of any of the signs of dysbarism in flight calls for an immediate descent to lower altitudes. A crewmember or passenger experiencing any of the symptoms should notify the pilot who in turn should divert the aircraft to lower altitudes as rapidly as possible. Any pilot experiencing symptoms of dysbarism should descend immediately before he becomes too incapacitated to control the aircraft.

The most effective preflight precaution against dysbarism is pre-breathing 100% oxygen. Your flight surgeon can brief you on the whys and wherefores. Inflight, your best defense against hypoxia resulting from explosive decompression is, of course, your oxygen mask. ●



OCTOBER

S	M	T	
In cold, turbulent air, helicopter pilots should be wary of overspeeds.	Under ideal conditions you can pick up ¾" of ice in 50 seconds—are you prepared for such *ideal* conditions?	In cold weather the efficiency of men working outside goes down; you can keep it from going down too far by sending out a jug of coffee.	Pitot c cover rain they're winter freeze pitot drains.
NAS Key West can ignore that one . . .	Today is Columbus Day. He was pretty sure he'd hit land if he went on far enough — but you can't always be so certain . . . that ocean is plenty cool in winter without a poopy suit . . .	Water in the gas lines freezes in winter and if you haven't checked flow from *all* tanks before takeoff, it can get mighty silent when you switch to that other tank somewhere along the way . . .	Nosewh very el ice un ver-r-r-y
Heaters, like school children, can be balky and troublesome when first put to work after summer idleness.	If the terrain is snow-covered white when you get there your depth perception might be fooled. Landmarks look different under snow too.	Winter is the best time to do a major overhaul on your power mower; did you take advantage of this past summer to work over your idle winter equipment?	Landing on a ru ice or snap. wishing tinted either.
On a cold, slippery flight deck in winter, engines are harder to start and airplanes are harder to stop.	On this date in 1922 LCdr. G. deC. Chevalier made the first landing on the USS LANGLEY. We've learned a lot about cold weather flying since then . . . has any of it rubbed off on you?	If you're wearing earmuffs or other ear warmth, you can't hear quite as well—make up for it by looking around even more cautiously.	You can battery warm w it's got even be don't de you actu

W	T	F	S
	"Octo" means eight; why then is October the 10th month?	NOW is the time for all good maintenance officers to see that sufficient winter working clothing is available for the men out on the line.	The experienced winter hunter leaves his rifle outside when he enters a warm cabin, so moisture won't condense on it—but sometimes you have to hangar a cold airplane . . .
Pitot covers were made to cover pitot tubes; summer rain may drain off if they're not covered, but winter rain can easily freeze in the tube. Use pitot covers, check static drains.	Freezing rain occurs when rain from a warm front falls through colder air. Better to climb up where it's just ordinary rain.	If you can't see the taxi lines because they're under snow, the taxi signalman can't see them either. Go easy.	Some northern airfields mark runway lights with flags to keep snowplows from tearing them up.
Nosewheel steering isn't very effective on snow or ice unless you're going var-r-r-y Slow-w-w-l-y.	Jet blast on snow makes water, which can quickly become dangerous, slippery ICE.	Anti-icing is not de-icing; know your equipment, when and how to use it for best results.	Some smart folks put antifreeze in their auto radiator before the first freeze—are you going to wait till you're adrift before checking your poopy suit?
Landing into the setting sun on a runway covered with ice or packed snow is no snap. It's no time to start wishing or hunting for tinted visors or glasses either.	"What—you didn't fill the anti-ice alcohol tank?—too late now! . . . "	Lower temperatures, like lower pressures, mean the aircraft is lower than indicated.	Know, don't guess, about runway conditions. Ask the tower! If you make inadvertent maneuvers during a landing "skid-out," they don't share the thrill with you!
You can run down a good battery pretty easily in warm weather; in winter it's got a lot less "poop" even before you start—don't demand more than you actually need from it.	Cold metal surfaces invite frostbite when handled with bare hands; if the job doesn't require bare hands, wear gloves.	Don't forget the Connie that settled on its tail when loaded with wet, heavy snow—the Boy Scouts have a solution: Be Prepared!	In northern regions radar returns from sea ice can be quite strong—in some cases it's even possible to get a complete reversal of the normal echos, can really "shake" the navigator if he's not prepared.

A WINTER'S

SNOW was no stranger to the Atlantic Coast Air Station but heavy snow was something of a rarity. When the first flakes fell they were regarded with pleasure, a prelude to the coming holiday season. As the white stuff kept on falling however, the pleasure changed to irritation. By late afternoon traffic was snarled throughout the area and long lines of automobiles inched along in blizzard-like conditions. At midnight, when the storm slacked off, few streets were open and most were blocked by cars whose owners had abandoned them and struggled home on foot. Newscasts talked of a near-record snowfall.

At the air station two trucks modified into snow plows were mustered for clearing the runways. A NOTAM sent out after dark read "two-foot snow drifts on the duty runway. Snow removal in progress." Although the equipment was considered inadequate for the job, clearance was completed on the north-south runway by 0500 in the morning. The "snow plows" kept at it and shortly before noon the east-west jet runway was open for traffic—the station was back in business again.

More snow fell that afternoon but the plows were able to take care of it and the runways remained in service.

Included in a previous NOTAM which announced the opening of the jet runway was a cryptic remark "patches of snow on runway." As it turned out this was

S TALE

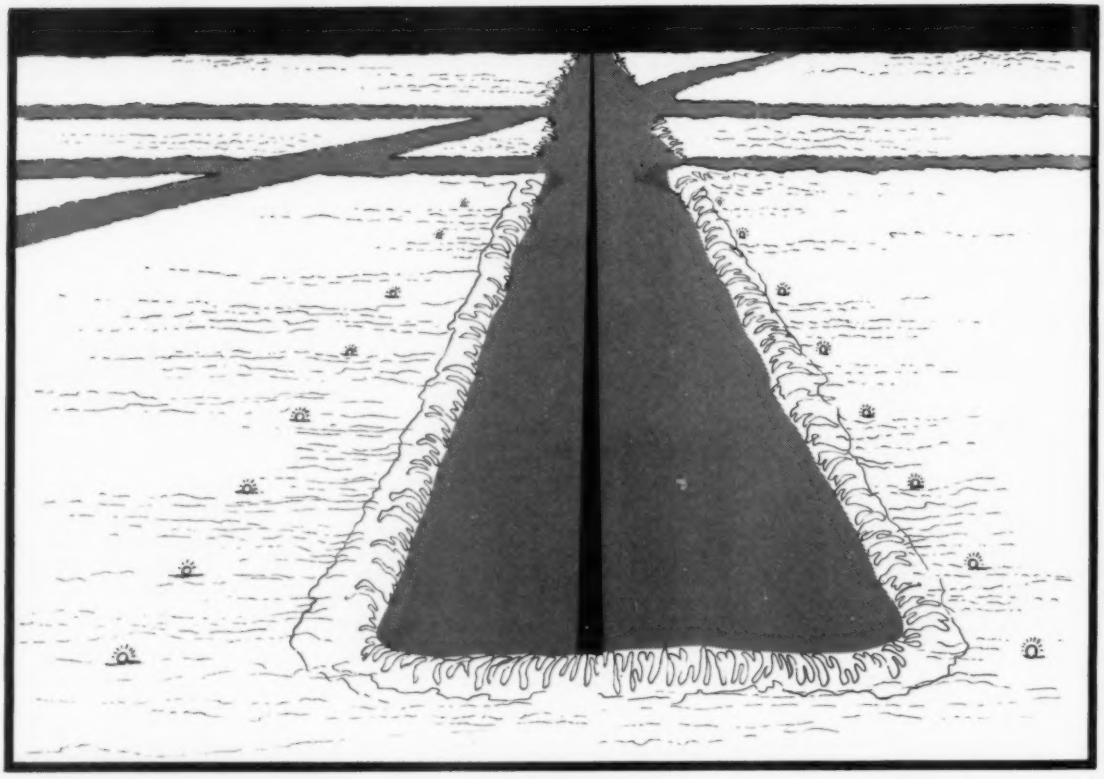
At northern air stations the treatment of snow-covered runways is an established routine. Where snow is an infrequent visitor more effort is required to keep flight operations safe.

not an accurate description of the conditions which existed and the wording of the NOTAM received a share of the blame for the situation which followed.

On the north-south runway the snow was plowed back 45 feet from the centerline on one side and 75 feet from the centerline on the other. The runway was 200 feet wide so the runway lights were well outside of the usable runway due to the snow banks. Conditions on the east-west runway were similar. Snow had been removed evenly on either side of the centerline for a distance of about 70 feet, leaving snow banks about 25 feet inboard of the runway boundary lights.

Two days after the storm the morning broke clear and cold. Local flight operations began about noon and no problems were encountered. Runways and taxiways were dry although somewhat narrower than usual due to snow being only partially cleared.

The trouble began after sunset. Weather continued clear but there was no moon. An S2F squadron had scheduled night flying and several aircraft had taken off from the east-west jet



On the 200' wide North-South runway the snow was plowed back only 45' to the left of centerline and 75' on the right side. Conditions on the East-West were similar except that the runway was cleared some 70' on each side of the centerline.

runway without trouble. In the process of taking the duty runway, one S2F (no taxi light installed) taxied to the right of the centerline due to the aircraft ahead lining up to the left. A routine thing but the pilot used the runway lights to judge his position on the runway and he was too far to the right.

Cleared for takeoff the S2F roared off down the runway—into a snow bank. The right wheel went into the snow first but the aircraft slewed to that side off the runway. The speed was such that the pilots were quickly into a modern version of *Jingle Bells;* "dashing through the snow, in a multi-engine sleigh."

Immediately the field was closed and emergency vehicles converged on the aircraft.

Complications set in a few minutes after the crash crew began working to get the S2F off the field. The FM radio was out resulting in communication between tower and emergency vehicles by messenger. Now a transient F9F-6 checked in over the field and the pilot inquired when he could plan on landing. Due to conditions at other fields in the area the jet was not advised to divert so the problem became one of holding the emergency vehicles off the runway and temporarily opening the field. After orbiting about five minutes the *Cougar* was cleared to land.

In the darkness the winking wingtip lights descended in what appeared to be a normal approach and the *Cougar* touched down near the threshold to the right of the centerline. This pilot too was too far off center and wham! —into a snow bank. There was a violent skid to the right and the aircraft slid sideways on the port main gear, port wingtip and nose gear until the nose gear snapped and it slid on the nose.

The field closed again.

Some time later, while the east-west was still fouled with the F9F-6, one of the S2Fs which had taken off earlier returned to the field. Surface winds were

east-northeast, five to 10 knots and the pilot requested the east-west runway.

"Negative," replied the tower. "Just had a crash there." The controller added, "We've had two crashes on it since you left and have to use the north-south. Only runway we have open."

"Roger," answered the S2F pilot. "Understand."

The S2F reported base leg and was cleared to land, crossing the runway end to the left of the centerline. Unfortunately this was the side which had been plowed only 45 feet from the center. "Just at the moment we touched down," said the pilot, "I noticed a white streak under the left wing . . . " The S2F rolled only a few feet when bang—into a snow bank!

This time the left main gear hit the snow. A slight left veer turned into a right skid with the aircraft moving sideways. Plowing back into the hard packed snow the nose gear collapsed, the nose dropped and both props hit the ground and bent.

Once more the field closed.

There were no injured personnel but the events of the evening racked up two substantially damaged aircraft. In accounting for the fact that other aircraft took off and landed without trouble you probably noted that all three pilots who went into the snow were lined up off center. This is interesting but the reason they did not make an attempt to shoot for the runway centerline is more instructive.

There are certain facts you can't change: The snowfall was unusual. Though the station equipment was considered inadequate for the task of snow removal a satisfactory job was done under the circumstances.

What was done with these facts is another matter. The NOTAM did not tell the story. A phrase "Snow banks all runways" would have done the job better, adding (despite the communicators displeasure), "Use center of runway only."

In the case of the transient F9F-6, the pilot received no information about the runway condition from the tower. The controller on duty said afterwards, "The tower was not informed that the snow was not plowed all the way back to the lights." Thus the stranger had no knowledge of any restriction to the listed 200-foot width of the runway.

The situation concerning the S2Fs was a little different from the F9F. Daylight flights had been made by the squadron using both runways (the pilot of the second S2F which hit the snowbank had flown during the day) but it was apparent that no pilot reported or attached any considerable significance to the fact that banks of snow existed within the runway boundary area and that this condition would be of great importance to night flying. Squadron supervisory personnel had made a careful inspection of braking conditions and cleared areas on the parking ramp but had not made a ground inspection of runways.

All the recommendations made by the accident boards can be gathered from the material presented above. Summed up, they said "communicate."

All in all, it was quite a night.

Lined up to the left, the pilot saw a white streak just before he hit the snow bank.

COCKPIT TROUBLE — The F11F-1 was at 33,000 feet at 100% rpm when the pilot noticed the low fuel warning light come ON. Total indicated fuel was 2600 lbs., of which 1600 lbs. were in the main tank. The pilot then saw the fuel balance indicator swing to the select aft tank position. He selected the aft tank only position and approximately 15 seconds later the engine flamed out. The pilot did not check the aft tank pressure indicator. The throttle was put to OFF and a glide set up at 220 KTS IAS.

The first attempted airstart was at 30,000 feet with the fuel tank emergency selector switch in the aft tank only position. The pilot thought he was at 20,000 feet. The second attempted airstart was successful at 29,000

feet, 225 KTS IAS in the aft tank only position. All indications during the airstart and acceleration were normal, except that the low fuel warning light remained ON.

The pilot made a straight in approach to NAS with the arresting hook in the stinger position. A normal landing was made. The starboard main tire blew just before the aircraft stopped at the end of the 8000-foot runway.

The flameout was caused by a bubble of air in the crossover tube which went to the engine when the pilot selected the aft tank only position. The pilot knew of the requirement of being below 15,000 feet when shifting to AFT TANK ONLY but did not think of it at the time.

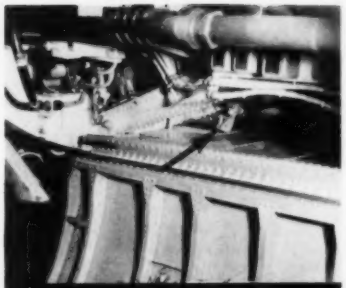
The fuel balance indicator went to the select aft tank position after the fuel quantity check switch was put in the main tank only position. Before the incident the pilot was aware that the fuel balance indicator should be disregarded when the check switch was on MAIN T.; however, this did not occur to him at the time.

The reason why the low fuel warning light remained ON is still being investigated.

All pilots have been rebriefed on the aircraft fuel system with emphasis on the use of the fuel tank emergency selector switch.

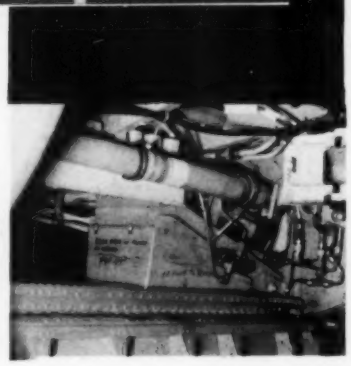
CRAMPED STYLE—One of the by-products of flying, little spoken of but important nevertheless, is (1) an ability to ferret out vacant space inside an airframe and then (2) jam all manner of gear into these nooks and crannies. The flight manual of one recent jet does designate a "radar/baggage compartment" but the black boxes as usual take the lion's share of space.

Each aircraft has its own particular baggage stowage problem and though there were only isolated cases in the past where pilot's gear interfered with the aircraft systems, the F9F-8T appears to have a weakness which could become habit forming. This weakness is the exposed nose wheel uplock in the forward gun compartment, a convenient space for baggage stowage.



The Trap—Arrow points to exposed uplock in the forward gun compartment.

THE VICTIM—a shoe, circled, is caught firmly between the uplock and deck. Once retracted the nosewheel cannot be lowered.



The Fix—Locally fabricated nose-wheel uplock guard installed by Corpus Christi.

Twice since the first of the calendar year, loose gear has jammed the uplock and forced the pilot to land with the nose gear up. Dimensions and construction of the metal guard shown in figure 3 are available upon request from the Naval Aviation Safety Center.

YOU WRITE THE CAPTION!

Another in our series of thought-provoking opportunities for you to become an author! Surely one of these two gents with shovels must have seized upon the opportunity to say something immortal right about this time—but were too far away to hear. So if you were within earshot, drop a card to APPROACH. Tell us what the lad on the right is saying to his buddy. We'll publish your caption with credit in a future issue of APPROACH, the magazine that lets YOU write the caption!

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Congratulations to APPROACH on selecting Sequoia high-lift paper for its magazine—every page of APPROACH can be folded into an airplane—improved stall characteristics possible only with STC paper.

'Recovery completed...'

AN A3D-2 crashed into the water after a bolter landing when the aircraft could not maintain altitude or airspeed because of insufficient power. Pilot and bombardier are believed to have sustained fatal injuries on second impact and sank with the separated nose section. The after portion of the cockpit remained intact during the crash permitting the successful escape of the gunner-navigator and the plane captain.

The gunner-navigator was saved from serious injury by his shoulder straps. The plane captain received a blow on the back of his head which cracked his APH-5 helmet and would probably have resulted in fatal injuries had he not retained the helmet in the crash.

The two survivors were picked up by different plane guard destroyers—one by whaleboat crew and the other by a swimmer. The destroyer rescue teams had been given an A3D cockpit checkout two weeks prior to the accident.

"The performance of the plane guard destroyers in conducting the rescue and search is considered to be outstanding," the AAR states.

Among the AAR's recommendations are:

● That float light life-rings be furnished for the use of personnel at the LSO platform to mark the site of crashes near the ship at night.

● That shipboard personnel concerned be cautioned not to throw pyrotechnic smoke markers or flares near the site of a crash because of the danger of igniting floating aviation fuel.

● That the feasibility of equipping plane guard destroyers with a device similar to a helicopter sling for use in the recovery of personnel from the water be investigated.

(*Note: For more destroyer rescue info, please see* APPROACH, *Nov '58, P. 11.*)

notes from your FLIGHT SURGEON

Keep Them On

A PILOT who ejected from an F8U-1 was about to be picked up from the water by a HUP-2. In the mistaken belief that he might not be able to clear the hatch of the helicopter with his inflated life vest on, he removed it along with his entire torso harness suit before entering the rescue sling.

A SURVIVOR SHOULD *NEVER* REMOVE HIS LIFE VEST IN A WATER PICK UP (suppose the hoist should fail or the rescue helicopter have to ditch) AND THERE IS ALSO NO NECESSITY WHATSOEVER TO REMOVE THE TORSO HARNESS SUIT. Survival officers should make sure the men in their squadrons know this.

Incidentally, the rescue hatch of a HUP-2 is 26 inches wide and 4 feet 6 inches long.

How Good Is "Good Enough to Fly"

THE pilot of an AD-5W, making his fifth night FCLP using the mirror, landed with gear up. The pilot was uninjured; the aircraft sustained substantial damage. Both the LSO and the wheels watch failed to observe the absence of the approach light until after the pilot was given the cut.

"The stage was set for this accident in the early morning hours when the pilot developed diarrhea and an ill feeling but felt 'good enough to fly,'" the flight surgeon states.

The day of the accident, the pilot was awakened at 0400 with diarrhea which continued until midmorning. At that time, he took a nap for about two hours. For lunch he ate two bowls of soup, nothing more. In the afternoon, he flew for about .5 hours making six FCLPs, then waited for a short time to start his night FCLP work. He had nothing to eat during this interval. He further stated to the flight surgeon that during the day FCLPs his mind was wandering "on nothing specific but not 100% on his work." He also stated that during the afternoon flight he felt uncomfortable in his exposure suit and did not feel too good but still felt "good enough to fly."

When you "don't feel too good," stay on the deck!

High-Viz Hat

THE T-28 pilot who reported a recent HR2S crash noted that one of the first things he saw, other than the wreckage itself, was the copilot's hard hat. It had been painted international orange as part of an experiment by BuAer and O&R, NAS Pensacola.

Walk Home

AS THE P2V-5F was slowly taxiing to the line after a seven-hour night patrol flight, the plane captain moved from his station to the nose wheel well to lower the entrance ladder. The ladder stuck on a hinge attached to the entrance door. When the plane captain tried to force the ladder past the hinge, he lost his balance and fell through the wheel well to the runway. Landing on his knees, hands, and chin, he picked himself up and walked across the taxiway and along the edge to the P2V line shack. Examined later at the dispensary, he was found to have a four-inch cut on his chin and a fractured jaw.

"Don't worry about it. It will blow off as we taxi."

Meanwhile as the aircraft proceeded to the line, no one aboard was aware of the plane captain's absence. After the aircraft was chocked, a member of the line crew notified the flight crew of the mishap.

The pilot "heartily concurs that the following formal procedures should be instituted in all commands flying P2V type aircraft":

1. All flight crews should be instructed to remain in their landing stations until the aircraft is in the chocks.

2. *After* the wheels have been chocked by ground crew personnel the pilot should tell the crew over the ICS that the plane is in the chocks and they may resume their normal securing duties.

3. The ladder in the nosewheel well should be raised and lowered by ground crew personnel.

4. Deviations in the above procedures should be permitted only in emergencies or when the plane crew is forced to do its own ground handling and then they should be subject to specific orders of the pilot in command.

Unsafe

ON A routine flight from the beach to the carrier, the lead pilot of a section of four *Demons* inadvertently lowered his gear at a speed of 400 knots while attempting to check the formation of his wingmen who were lining up on the starboard side.

In order to be able to see the formation better (vision out the

starboard side of the F3H-2 is restricted by the inflight refueling probe), the pilot unlocked his inertia reel and leaned forward and to the right. As he extended his left hand to the port side of the instrument panel to brace himself, he struck the gear handle. The gear extended with a jolt. He slowed down and checked his gear indicators. The main gear indicated unsafe and the nose gear, down and locked. Making a visual gear check, his wingman advised him that his port gear appeared to be down and locked but his starboard gear was hanging loose and slightly rotated. The pilot returned to the beach and made an arrested landing.

The pilot states, in his opinion, the accident could have been prevented by a combination of three things:

- Methodical and deliberate movements on his part.
- Improved design of the refueling probe to ensure better visibility out the starboard side of the cockpit. With the present design, the pilot must sit high in the seat and lean forward for maximum visibility.
- Improved design of the gear handle with a lock or "pull out" type mechanism that would preclude lowering the gear inadvertently by striking the handle.

AD Gunsight

"THE location of the gunsight above the instrument panel in AD aircraft makes the pilot particularly vulnerable to head injury or unconsciousness (during conditions of abrupt deceleration). Therefore, the importance of extremely tight shoulder harness and lap belt cannot be overemphasized.

"It appears that general dissemination of information regarding the value of certain safety modifications, i.e., installation of helmet nape straps, does not reach or make a sufficient impression on all individuals.

"It is recommended that every squadron schedule individual personal flight gear inspections to insure that each pilot has all his personal flight equipment up to standard."–*Flight Surgeon in MOR*

Cockpit Configurations and Vertigo

VERTIGO resulting from the pilot's attempt to change UHF radio frequency in the overcast is suspected as the most probable cause of a fatal crash of an F4D-1.

The AAR states that the location and lighting of the UHF radio control box in F4D aircraft contribute to inducing vertigo while the pilot is changing frequencies under instrument and night conditions. This situation is aggravated by any non-standard location of the control box on the console.

After the accident, a study was made of F4D cockpit configurations in the squadron. This revealed that the arrangement of UHF control boxes on the right console did not conform in any of the aircraft with the arrangement outlined in the current flight manual. The UHF control box was installed in four different positions in the aircraft studied; no more than five of the aircraft had identical arrangements. (Squadron maintenance personnel were aware of the non-standard location of control boxes but no positive action had been taken to correct the situation. No records were available to determine whether the configurations had been changed while the aircraft were in custody of the squadron or whether the aircraft had been received in that condition from former custodians, the AAR states.)

The non-standard location of control boxes on the right console of all squadron F4D aircraft contributes to the difficulty of selection of UHF radio frequencies, the AAR continues. Such a condition generally requires that the pilot turn his head to see where the UHF control box is located. Usually he must continue to look at the control box while he selects the desired frequency. A standard location for the control box on the console would at least reduce the time a pilot has to divert his attention from the flight instruments to effect a frequency change, the AAR states.

Aircraft Service Change 138 will direct the installation of an indicator on the instrument panel to show the UHF channel selected. The control box will remain on the starboard console.

Overinflation

THE primary means of inflation of your PK2 life raft is the CO_2 cylinder. If this doesn't work, the secondary means is oral inflation. BUT beware of combining the two methods or you may overinflate your life raft with disastrous consequences.

After a successful ejection, parachute descent and entry into the water, the pilot of an FJ-4B inflated his life vest, then prepared to inflate his life raft. When he could not find the CO_2 cylinder or the toggle to activate it, he located the oral inflation tube and began to blow the raft up. Finally locating the CO_2 cylinder, he discontinued the oral inflation and pulled the cylinder toggle. The raft inflated.

"Entry into the raft was successful," the pilot reports, "but approximately 30 seconds after entry, *the raft exploded.*"

Fortunately, the pilot was picked up by helicopter 20 minutes later.

If you should begin inflating your life raft orally and then for some reason switch to CO_2 inflation, you should relieve any excess pressure

inside the raft by depressing the valve on the oral inflation tube.

If you are not familiar with the workings of your life raft or the locations of the CO_2 cylinder and the oral inflation tube . . . see your parachute rigger or your squadron survival officer NOW.

Sucked Into Intake

JET aircraft + catapult launches = flight deck safety hazards which only continual alertness can guard against.

A member of the flight deck catapult crew stood up 4 or 5 inches in front of the port engine of the F2H-4M which he had just hooked to the starboard catapult. (Normal procedure aboard the carrier was to roll from under the aircraft and keep well clear of the intakes.)

Both engines were at 100%. As the crewman stood up, he was lifted off his feet, head first and backwards, into the inboard jet intake. As soon as the pilot saw the crew's cut signal, he shut both engines down and the crewman was pulled out. His heavy flight deck jacket which had been sucked over his head had afforded him some protection. However, he suffered a brain concussion, multiple abrasions and injuries to his right hand requiring 26 days' hospitalization.

Follow Your Lanyard

A PILOT who ditched an A4D-1 had trouble finding the toggle to inflate his PK-2 life raft. His inflated life vest kept him afloat. When he saw two helicopters approaching he gave up his attempt to inflate the raft. In his narrative of the accident, he states, "I would like to recommend that each pilot refresh his memory periodically concerning the location of the toggle and other items of his emergency equipment."

The following applies only to the high speed pararaft container used with the integrated parachute system such as in the A4D and F8U aircraft.

To locate the toggle on the pararaft CO_2 inflation cylinder, simply follow your pararaft lanyard along its length to the pararaft pack. To open the pack, pull the pararaft ripcord handle which is located in a small pocket. The lanyard is secured around the neck of the CO_2 cylinder. The toggle for actuating the CO_2 cylinder which inflates the life raft is located at the top of the cylinder —pull it.

Elbows In

IN A recent accident in which an instructor and a student ejected from a TV-2, the student sustained a severe cut as his elbow hit the cockpit sill on ejection. The reporting flight surgeon submits the following recommendation:

"Injuries to the upper extremities of pilots ejecting from the TV-2 aircraft continue to occur. The last two TV-2 ejections in this area involved injury to the elbow. In view of the narrow width of the TV-2 cockpit it should be strongly emphasized to all pilots flying in this aircraft that the elbows must be held close to the body (on ejection) in order to prevent injury to the elbow or upper arm."

Survival Vest

TWO recent accident reports, one on an F9F-6 out of a midwest base and the second on a T-28B out of a southeastern air station state that the pilot in question was not carrying the essential items of survival signaling equipment because he was flying in an area where a life vest is not required.

One answer to this problem, as pointed out by the endorser of one of these reports, is the SV-1 type survival vest. The SV-1 type survival vest is available in

the Section H Allowance List of September, 1958, Federal Stock Number R8415-300-5431-LF50. The allowance is 100 percent pilot and non-pilot crewmembers of VA, VF, VS and HS aircraft assigned to squadrons.

Quick-Fit Disconnect

THE pilot in a recent F9F-8T accident was wearing a G-suit with the old-type disconnect adapter; he was not aware of the existence of any new type spring-loaded disconnect adapter, the flight surgeon reports. Although this had no bearing on the accident in question, it calls attention to the need for passing the word. And the word is: BACSEB 35-57A: Replacement of Coupling Component of the Quick Fit Disconnect in the Z-2 Anti-G Coverall (FSN RH 8475-261-6417 [through 6427]-LF50) dated 18 Oct 1957. If you have any doubt as to whether or not your G-suit has been modified, see your parachute rigger. ●

...THE PILOT HAD ESCAPED FROM THE CHOPPER WHEN IT WAS ABOUT TEN FEET BELOW THE SURFACE

TWO DOWN

"IT STARTED out like any other working day," the crewman of a HUP-2 on plane guard duty stated in his account of the events before and after the aircraft's ditching following engine failure.

As soon as the plane hit the water, the crewman unbuckled his safety belt. Although the impact did not bother him, he was "dazed for a few seconds" by the force of the water rushing in.

"As soon as I got myself together I took off my helmet and began looking for the emergency exit hatch," he recalls. "I was unable to see because it was too dark. Finally, I gave up looking for the exit hatch and began looking for other means of getting out of the fast-sinking plane." (For maximum head protection in such a situation, it is recommended that the helmet be retained.)

He began to swim forward toward the cockpit where he saw a little light thru the pilot's window and swam toward it. As he tried to swim thru the window, he was held back and realized that he was hooked to the plane in some way.

"The pressure was getting worse by the seconds," he stated later. "My head felt like it was being ripped from my body. Finally I forced myself free and began to swim toward the surface . . . I guess the plane went down about 50 to 75 feet before I forced myself free."

He tried to inflate his life vest while he swam to the surface but only one side worked properly, probably due to a loose cap on the CO_2 cylinder container.

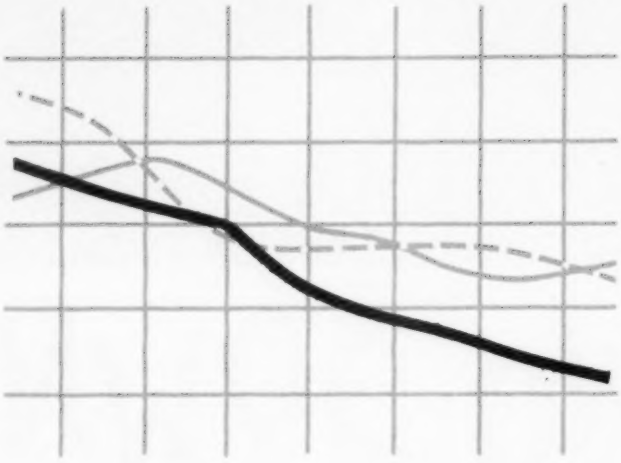
Meanwhile the pilot had escaped from the helicopter when it was about 10 feet below the surface. He surfaced, looked for the crewman, then dove and swam down 20 to 25 feet to the aircraft. Although he saw a red helmet against the aft right window, he saw no sign of the crewman. By this time the pilot was having a hard time holding his breath and started swimming for the surface again. Reaching the surface, he inflated his life vest. About 15 seconds later he spotted his crewman about 50 feet away with his partially inflated life vest. The crewman was not making any movement.

When the pilot swam to him, the crewman reached out and held on to him for a few seconds, then lapsed into unconsciousness. The pilot held him above water until the rescue helicopter lowered the three-pronged rescue seat to them. Placing the crewman on the seat, the pilot climbed on the other side and they started up. When the crewman slid off the seat, the helicopter relowered the seat into the water. Holding on to the seat with one hand and catching the crewman with the other, the pilot tried in vain to position the unconscious man on the seat. Waves were breaking over the crewman's head.

Finally the pilot straddled the seat and pulled the crewman up against the seat with his back to the shank. The pilot put his arms under the crewman's arms and locked his hands across the crewman's chest. Although the winch slipped, the helicopter raised both men at the same time, a lift of some 400 pounds.

As soon as the unconscious crewman was aboard the helicopter, the rescue crewman began artificial respiration. This action was later credited with saving the man's life. Thirty to 40 minutes passed before he regained consciousness.

"It started out like any other working day," but it turned out to be a day the HUP-2 crewman will remember the rest of his life. ●



The major flight accident rate is going down . . .

meanwhile, out on the ramp!

By M/Sgt Chas. T. Perkins
Aircraft Maint. Section, 3rd MAW

Well men, this month was a rough one on your old maintenance chief. I really thought that I had had the course when I started taking notice of and tabulating all of the safety regulation infractions in my "tight" outfit. You know, there were things going on that I hardly believe could happen. For instance, in the very first week that I had started jotting these errors down, I had four, yes 4, cases of NC5s being parked next to an aircraft with the generator engaged and no one in the driver's seat. Now we know that this just isn't supposed to be, but I found them, and you know what, when I admonished the drivers they told me that it was SOP for them to operate in such a manner. Well, I took care of that with a lecture on the whys and wherefores of driving and operating the NC-5 and I thought I had that situation cleared up.

Before the end of that first week, I was beginning to wonder just how we had ever got through to Friday without having a fatality among the mechanics. There were two cases where there were so many people riding on a TUD-80 that you couldn't see the vehicle for the bodies on it. After clearing all of the excess bodies off the vehicle, I felt that I had really saved someone from a bad accident. But wouldn't you know just as I turned my back from this chaos, here comes another TUD-80 towing one of my prized aircraft with the mechanic standing up in the cockpit. Talk about seeing red. I hauled that man out of the cockpit and gave him the unadulterated word as to what his job was there in the cockpit during towing operations. His excuse—it was a hot day and he wanted to catch as much of the cooling breeze as he could. Well, I'm here to say that I gave him some breeze, but it wasn't very cooling.

About the middle of the week I was on my fact

The ground accident rate . . .

finding tour and noticed a number of personnel throwing or setting cigarets down in dangerous places. Now, this here presents quite a problem. A man who smokes needs that cigaret every once in a while, but there is also a lot of very expensive machinery that could be lost if it was set down in the wrong place. After finishing my tour, I sat down and set up a system whereby there would be designated smoking areas and sufficient butt kits in these areas to try and prevent tossing a lit cigaret just anywhere. I also attempted to place these smoking areas in a sufficient number of places so that they would be readily available to all smokers. There was no mention made of disciplinary action or anything like that 'cause I don't believe this would have helped to gain the cooperation of the men. But although it was not mentioned, I had still reserved certain decisions as to what would happen had a man not complied with the order.

This first week was sort of rough, but it closed out Friday with a typical "No Think" discrepancy on the part of some of my mechs. While checking the work being done by some of the check crews I noted that they were doing maintenance work in "hot wire" area without first disconnecting the battery to insure that the battery bus was dead. I spent almost half a day trying to put over to the people involved that a dead battery bus is much better than a dead mechanic.

The rest of the month was just as hectic as the first week. During the second week I observed 3 more cases of overcrowded TUD-80s, 2 cases of engines being dropped out of ground handling stands due to improper handling by the crews, 3 more cases of unmanned yet operating NC-5s parked in close proximity to the aircraft, 2 additional cases of the mech standing up in the cockpit while the aircraft was being towed, caught one man discarding a cigaret in an unauthorized area, 3 of my more experienced men slipped off the wings of aircraft due to oil on the surface or on the soles of their shoes, and one case of liquid oxygen men servicing an aircraft without the use of a face shield. To expand on a couple of these, the man involved in the misplaced cigaret case is staying real close to water for the next ten days—he is captain of the heads. The NC-5 operators were assigned to 2 hours of schooling on the NC-5 while the men standing up in the cockpit of the aircraft were reprimanded. As far as the men slipping off the aircraft, there is no punishment or lecture that could help them. They are experienced in their jobs and should have known better. In the cases it was found that they had all attended a party the night before and were in a slight case of shock due to lack

. . . is going up!

of sleep. Let's face it, their heads were on their shoulders but their marbles were still back in their lockers.

For the remainder of the month, infractions such as those already set forth took a decided drop. True, there were still a couple of cases of unmanned operating NC-5s, overcrowded TUD-80s, standing in the cockpit during towing, no cases of smoking in illegal areas and as a whole, all discrepancies took a decided drop. I felt that my observations and subsequent correcting of these errors was the cause for the sudden awakening to good safety practices. But as will happen in any unit, there is always that ten percent.

I was just starting to congratulate myself when on one of my regular tours I witnessed a junior man attempting to hook up a mobile compressor to a TUD-80 and the vehicle started rolling away from him. After a slight lapse of time comparable to a "Chinese Fire Drill" I was able to speak to the man coherently. After much ado he admitted that he was just too doggone lazy to walk the few yards to the line shack and get help. As to why the brakes weren't set—"I dunno." If the slope had been in the opposite direction, there would have been one badly mangled mechanic, who, although assigned as part of my crew, wouldn't have been there to share his load. You would have thought that this would have

been my ration for the day, but in the afternoon I went to the flight line to observe, and there just as bold as can be, were two mechs turning up aircraft spotted next to each other without inlet duct screens installed. There went my blood pressure again. After an immediate shutdown, I asked them why screens weren't in use. No excuse, just laziness on their part. I might add that in the short time that the engines had been turning up, one of them picked up foreign object damage. That also emphasized the laxness of the "bend over" campaign in our unit. Now we have a pick up program every morning before the turn up of the aircraft.

In order to prevent this paper from becoming a book, may I just run down the list of the remainder of the items I noticed and have attempted to correct during the past month.

1. Four cases observed of people throwing coke bottles off vehicles in motion. Coke machines were removed and those utilizing paper cups were installed.

2. A number of personnel carrying screwdrivers in their hip pockets while working in the cockpit of the aircraft. This leads to torn parachutes and other cockpit equipment. This is a dangerous practice even though not in a cockpit. A sudden movement in a particular direction could drive the screwdriver into the man's back.

3. The problem of the proper disposal of rags and the cleanliness of drip pans was thoroughly hashed over by the supervisors of the maintenance section. Rag containers have been installed in greater numbers and the importance of clean drip pans emphasized to the crew leaders.

4. The use of unauthorized equipment as work stands was very noticeable during the first period of observation. By repairing deadlined equipment and making more efficient use of what we had, this problem was just about done away with.

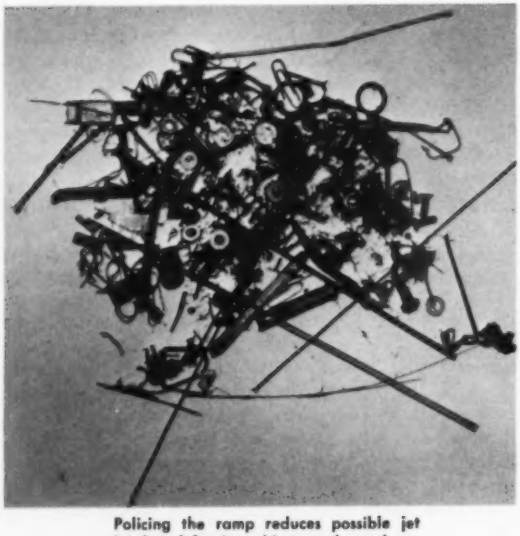
5. Unauthorized solvents being used in the shops. A forgotten drum of unauthorized solvent was removed from the area and only those authorized will be allowed on the rack.

6. A noticeable number of personnel working around the aircraft were observed with large amounts of loose objects in their pockets. A program is under way to furnish these men places where they can lock up personal objects from their pockets during periods in which they will be working in close proximity to aircraft turning up.

7. Personnel still do not have the proper respect for liquid oxygen. A training program of a continuing nature is under way to make all personnel aware of its dangers.

8. Many cases of towing aircraft with foreign objects of one type or another on the wings or airframe were noted. This has been completely halted. These objects can and do fall off and can cause extensive damage to the aircraft or the object which fell.

It is desired that YOU read this list and see how much of it has happened in YOUR unit in the past month. Maybe you were the one who submitted these observations. Doesn't it fit your unit pretty well? Let's all clean house and raise our safety practices to the ultimate goal of perfection.

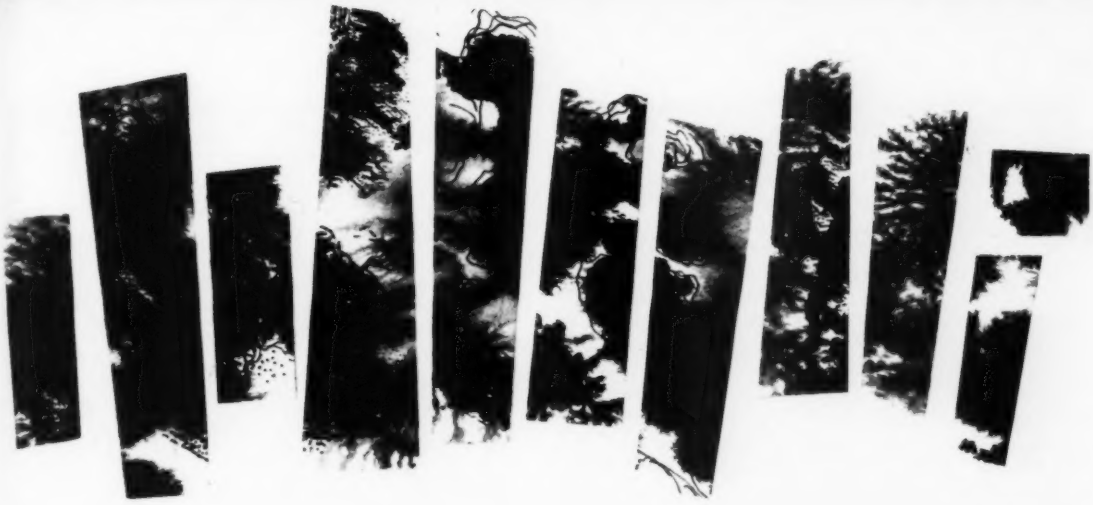


Policing the ramp reduces possible jet intake of foreign objects such as these.

GROUND DAMAGE CUT-OUT—Continental Airlines has equipped all its ground service equipment with antenna-like rods set at an angle of about 45 degrees. Ignitions of the mobile units are cut and brakes are automatically activated when the tip of the rod comes in contact with the aircraft being serviced on the ramp. It is expected the device will substantially reduce ground damage to aircraft.—*Aviation Age*

Quotable

Our most serious accidents for 1958 involved lack of supervision. The largest and most fertile field for improvement in our flight safety appears to be in the supervision exercised by commanding officers, operations officers, engineering officers and maintenance personnel.—*USCG Safety Letter*



CORROSION PREVENTION

The pilot of an F2H-3 entered the landing pattern at an NAS and attempted to lower his landing gear. On the initial attempt, the starboard gear stopped in an indeterminate position and could not be moved further. After several attempts to lower the gear by the normal and emergency method, the pilot proceeded to NAS Cecil Field and landed in the arresting gear. Upon contact with the runway, the aircraft swerved off the runway into the grass alongside of the runway considerably reducing damage to the aircraft.

The starboard main landing gear actuator failed and froze in an indeterminate position. Inspection of the screwjack disclosed a heavy layer of salt on its surface. The aircraft had been spotted on the flight deck for 20 days following a Mediterranean deployment. During this time at sea, heavy weather was experienced for about 10 days, causing great quantities of salt spray to cover the aircraft. The aircraft were preflighted several times during the crossing and several pilot turnups were held. In addition, all aircraft were thoroughly cleaned with fresh water prior to flying off the ship. It is suspected that moisture mixed with the salt and when it was subjected to the low temperature at high altitude, a solid coating of brine was formed and which did not melt during the rapid descent. The coating backed up on the threads of the screwjack and locked it after only a few inches of travel.

The Commander Fleet Air stated, "It is apparent that the measures taken to prepare this airplane for flight under the existing conditions were inadequate and the preflight inspection was not carried out properly."

Although this report involves an older model aircraft it lends emphasis to deployment preparation advocated for the A3D. The manufacturer recommended:

1. The horizontal stabilizer be sealed against salt atmosphere with sealant such as EC 801.
2. Trailing edge of horizontal stabilizer be deburred and given a larger radius to insure proper adhesion of surface finish.
3. Aircraft paint coat be put in tip-top condition.
4. All steel fasteners in the horizontal stabilizer and wing be painted over with a mixture of 10 percent Stoddard Solvent, 90 percent Petrotec amber Mil-C-19471.
5. Stainless steel hydraulic lines in bomb bay, wheel wells, and wing fold areas be painted with one coat etch primer, one coat intermediate primer and two coats acrylic base lacquer. If the above cannot be accomplished recommend coating lines with Petrotec amber.

This should give a strong front against corrosion attack; however, its results will be more effec-

tive if the following are also accomplished:

1. Petrotec amber coating maintained by touching up periodically.

2. Paint coat maintained properly. It does no good to just paint over a scratch without first cleaning and preparing surface.

3. Aircraft cleaned periodically. This should be done with fresh water and a neutral emulsion type cleaner or any cleaner approved under Mil-C-18687. Due to limited fresh water aboard a carrier it is realized that this will be difficult. If only one bucket is allowed per plane, use it to wash along lines of attachments on wing and stabilizer surfaces. Attention should be paid to cleaning the side of aircraft facing forward on the ship due to salt spray being continually blown into the surfaces by wind. Whenever the ship is in port and fresh water is available, aircraft should be thoroughly washed.

► Aircraft should never be washed with an aviation gas or jet engine fuel, as these are severely detrimental to paint coating.

► In the event corrosion is found, old finish, corrosion products, dirt, grease . . . must all be removed from area. Grease, dirt, and old finish can be removed by using Fed. Spec. TT-T-266 thinner and Mil-C-6135 cleaning compound.

► Heavily corroded areas may possibly require the use of abrasive paper for complete removal corrosion products. Corrosion products must be completely removed to stop growth of corrosion nucleus. The area should then be flushed well with water to remove cleaning compounds, thinner . . . and surface treated.

► Surface treatments for the various metals given in structure repair handbook, AN 01-1A-1. After surface treatment, area should be repainted.

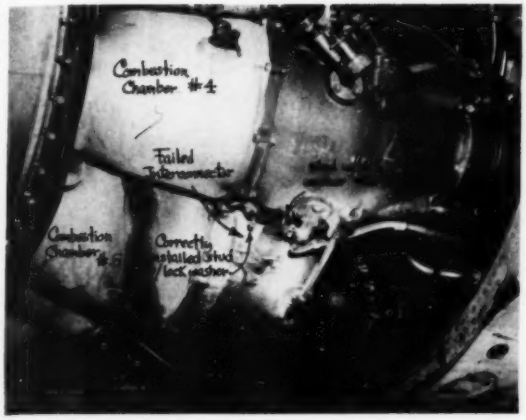
HOME MADE GASKET—While outbound to the gunnery area at 18,000 feet, the F9F-2 pilot noticed the RPM decreasing. The TPT was 400° at 80% rpm, continuing to decrease. Pilot retarded throttle and at 30% rpm switched to emergency fuel system. The engine responded and RPM increased to 50%, TPT also rising. Engine then flamed out and RPM stabilized at 10%. A successful relight was obtained at 11,000 feet in emergency fuel system. Pilot made a precautionary landing.

Investigation showed a locally manufactured fuel control mounting gasket did not have an oil lubrication hole. Lack of lubrication caused fuel control drive shaft to shear and subsequent failure of fuel control. It was recommended that the use of unauthorized gaskets be discontinued and all maintenance personnel be instructed to use only the authorized seals and gaskets when replacing fuel control units.

HELPING HAND—An F11F was being respotted from the flight deck to the hangar deck via the number 2 elevator. Because of a maladjustment the elevator came to a stop approximately one to two inches below the hangar deck level. An attempt was made to push the aircraft over the lip by applying a steady pressure. The ship had a slight port list at the time. The handling crew was able to push the lightly weighted nose of the aircraft into the bay, but the main gear hung on the lip. Noting the difficulty, the relatively inexperienced elevator operator attempted to raise the elevator flush with the hangar deck using manual control. As the elevator passed the flush position the pressure exerted by the handling crew moved the aircraft off the elevator and forward about eight feet. The elevator continued upward approximately six inches and in the process, tripped the stanchion relay. One stanchion and its associated cable struck the aircraft tail assembly.

The elevator operator committed a serious error of judgment which resulted in costly damage to the F11F. His error was committed as the result of his trying to do the job better. By raising the elevator in manual, he made it easier for the plane to be pushed off; however, he overlooked the important fact that once the plane was off, the elevator would raise slightly. In this case it rose enough to actuate the stanchion relay.

CLEAR CUT—The combination of a maladjusted carrier elevator and an inexperienced operator put a costly F11F out of commission.



F9F INTERCONNECTOR FAILURE—The interconnector between combustion chamber four and five failed, allowing flame to escape from the chambers. One of three studs holding the interconnector to chamber four was installed without the required lockwasher (see photo above). During the 50 hours operation since the engine's last check, the incorrectly installed stud loosened, allowing the cooling air flowing through the interconnector to escape between the combustion chamber cover and the magnesium interconnector housing. The heat from the escaping air caused the magnesium casting to fail, thereby allowing open flame to damage the aircraft's tail section, right.

OVERTEMPERATURE AND OVERSPEED—Reports from O&Rs show that an increasing number of jet engines are being received for overhaul which have been operated in an overtemperature condition. In most cases there is no entry in the engine logbook to indicate the amount or duration of overtemperature which the engine experienced.

Now this is not only bad—it's extremely dangerous. Overtemperature is by far the most serious deteriorating agency acting on the turbine assembly. The condition is compounded when accompanied by an overspeed. During overtemperature, the turbine blades are subjected to a thermal-shock, i.e., a sudden increase in the temperature on the surface of the blades. The resulting large temperature difference between the blade surface and core can produce minute cracks in the blade. These cracks continue to grow larger with each subsequent overtemperature. In addition, the first crack is the opening wedge for a progressive fatigue failure. The ultimate result is failure of the turbine blade(s). This situation manifests itself to the individual in the cockpit by vibrations, loss of thrust, high or excessive tailpipe temperature . . . , all those unpleasant things that you don't want to happen while you are flying.

The odds that this will happen can be slanted in your favor by the application of a few simple procedures. The first, obviously, is to not overtemp or overspeed the engine. Just as obviously, this is not always easy to do but there is a practical solution. Each time an overtemperature and/or overspeed condition is observed by pilot or mechanic, log it on the aircraft yellow sheet and include the temperature, RPM and duration. This information in turn should be logged in the engine logbook.

By promptly and correctly reporting each overtemperature and/or overspeed condition, maintenance personnel can then perform thorough inspections to determine the degree and condition of damage. By this action a future complete engine failure can be prevented.

It should be emphasized to all concerned that overtemperature and overspeed conditions do damage jet engines, the degree of damage being dependent upon the amount of overtemperature or overspeed. Engine failure usually occurs at some future time. When it occurs depends on the degree of damage and operating conditions.

By not reporting overspeeds and overtemps as they occur, you are passing along a dangerous condition which could very well "dig a hole" for a friend. Following an over-temperature or overspeed: REPORT—LOG—INSPECT!—*ComNavAirPac Safety Bul.*

OIL STARVATION—The left engine of an R4Q-1 failed at approximately 6200 feet in a climbing altitude, and at climb power setting, following take-off 12 minutes earlier. High thin overcast and 10 mile visibility. Throttle was retarded, engine feathered and secured. IFR clearance was cancelled, a VFR descent was made. A single-engine approach and landing was made on runway 19 at NAS. Cause of occurrence was unknown.

After a priority DIR it was determined that failure of the engine was the result of a momentary loss of oil pressure during starting.

CLAMP INSPECTION—The AD aircraft maintenance officers were urged to require a more stringent inspection of heater hoses and hose clamps. Indications exist that a "complacent" attitude is developing which must be stopped right now because carbon monoxide is a killer.—*MAG 31 (REINE)*

Aircraft Fluids Like Blood — Transfusion Requires Correct Type

Quite recently an air transport had to make a forced landing because of complete power loss. Investigation disclosed a worker had put ethylene glycol in a drum that was supposed to contain ADI fluid and the ethylene glycol had been put into the aircraft's ADI tanks!

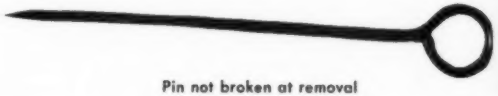
The mechanic, of course, was blamed.

However, maintenance practices as a whole contributed to the error. In this case the servicing cart had been replenished from a drum storage area which contained drums of various liquids. The contents of the drums were identified by markings on the drum ends, but the hand pump used to transfer fluids from the drums to the portable tanks was inserted in the side bungs where there were no identifying marks. Result . . . ethylene glycol was put into a tank that should have been filled with ADI fluid.

As one engineer has suggested, "Indiscriminate storage of drums containing a variety of liquids is asking for trouble—fire, explosion, the danger of mistaking one liquid for another, such as caused the air transport to crash land. Extremely poor housekeeping is more to blame for this accident than the mechanic's mistake!"—*FSF, APB 58-10*

ADRIFT PIN LOCKS RUDDER—While at 100 feet altitude in MAD hunting pattern, the P2V-5F aircraft started to vibrate slightly. Upon check of controls it was discovered that the rudder was locked in approximately neutral position. Return flight was made to base and landing was made on the runway. On landing rollout the rudder control became free and normal.

A 3-inch spring steel pin had been lodged between the rudder auto pilot servo planetary housing and the auto pilot servo pulley locking the control surface through the auto pilot servo cable. Pin dropped to a position that permitted free control movement upon landing.



Pin not broken at removal

Origin of the pin is unknown. It appears to be an upholsterer's pin and was probably left adrift during manufacture or overhaul.

THIN-SKINNED—Following a forklift accident which damaged an F9F-8, this note of warning was issued: Personnel working on or near aircraft must be well indoctrinated with regard to the care that must be exercised with aircraft surfaces. Although aircraft appear solid and strong of surface, they are in fact, thin-skinned and fragile when forces, other than aerodynamic, are applied.

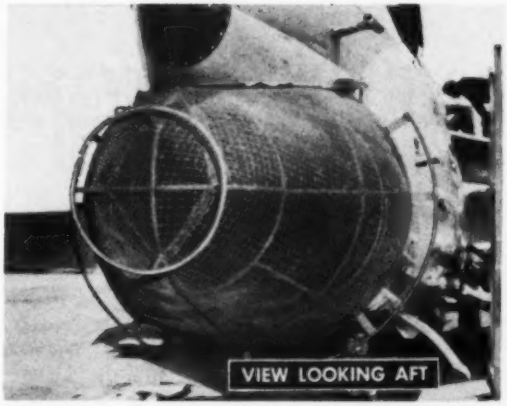
SIGNAL CHANGE—Following a normal start of an F4D-1 during a night practice alert scramble the pilot commenced taxiing before the turbine air starting unit was pulled clear of the aircraft. The pilot mistook a light signal from an ordnance man for an all clear signal. The turbine starting unit steering handle caught on the starboard main wheel mount oleo scissors, causing the unit to be pulled about one mile by the aircraft while taxiing.

Light signals from an ordnance man indicating ready ordnance was mistaken by the pilot for an all clear signal from the plane captain. The nose wheel chock was pulled before the aircraft was ready to leave the line. Squadron SOP changed placing sole responsibility of giving hand or light signals with the plane captain.

SCREENS OVER AIR INLET DUCTS SAVE LIVES—A few days ago another airman lost his life because someone failed to assure that protective screens were placed over air inlet ducts during ground run-up of a jet aircraft engine. That fatality could have been avoided if the victim and his supervisor had complied with ground handling portion of the applicable maintenance instructions. Inadequate supervision and failure to observe safety precautions can cost the lives of maintenance personnel who work around jet aircraft.

It is often true that familiarity breeds contempt. This sometimes causes an experienced man to become negligent and disregard prescribed safety precautions when servicing a jet aircraft undergoing engine run-up. The noise of an operating jet engine and preoccupation with assigned duties can cause an airman to forget the recommended and prescribed ground safety measures.

All maintenance personnel should be well aware that jet engines must never be operated during maintenance run-up unless safety screens are properly installed at the air inlet ducts. Attention is also invited to the various other safety precautions.



LIFESAVERS—Screens over inlet ducts saves lives. This type protects YOU from being ingested by the carnivorous F8U.

For example, in areas where jet engines are operating people should remain at least 25 feet from any jet intake during engine operation.—*TIG Brief*

Conclusions and Recommendations from Selected Engine Disassembly and Inspection Reports

(For use by operating and supporting activities)

J65-W-16A Engine removed for low oil pressure. Engine oil pump tested in the "As Received" condition revealed no discrepancies were noted. Investigation revealed that the flapper valve PN WAD-608881 had fallen off the counterweight in the oil tank and this condition could have caused this malfunction.

Recommendation: It is recommended that a periodic inspection be made of the vent valve and attaching pin in the increased capacity oil tank.

J71-A-2A Engine removed due to unstable and erratic operation. Disassembly revealed no basic engine discrepancies. The ice indicator switch PN 6740297J was found inoperative. This would allow anti-ice hot air to flow, causing the engine to be more susceptible to compressor stalls and erratic operation. De-ice switch diaphragm was found ruptured and dirt particles were found trapped on both sides of the diaphragm de-ice element.

Recommendation: Insure that anti-ice air is not flowing when de-ice circuit is off.

J34-WE-34 Turbine nut seizure. Resulted in helicoil coming out when turbine was removed.

Recommendations: Always soak turbine nut with penetrating oil prior to removal.

J48-P8 Loose compressor case through bolts caused excessive vibration of diffuser resulting in diffuser failure, deep grooving of compressor case and excessive wear of compressor front casing.

Recommendation: At time of periodic maintenance inspections retorque compressor through bolts.

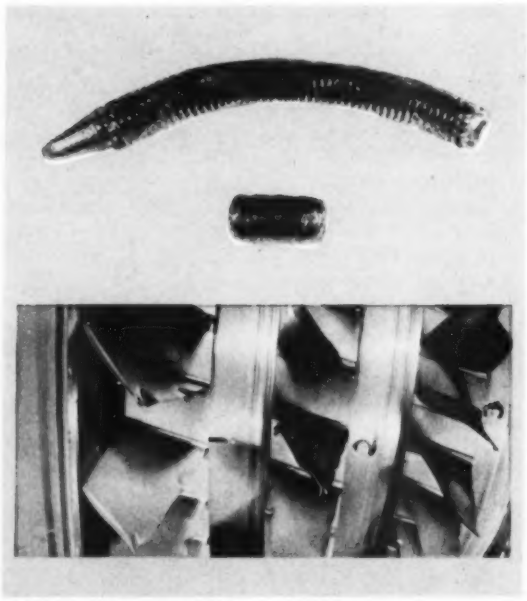
J57-P6B Engine removed for oil contamination revealed flaking of chrome plating on inside diameter of turbine rear bearing housing, and quantities of carbon particles were present throughout the engine lubrication system. All of the engine carbon seals were intact and undamaged.

Recommendation: Every precaution should be taken to prevent entry of contaminants during the servicing of the oil systems.

FOD REVIEW YOUR PROCEDURES

Foreign object damage is still the predominant cause for turbojet removal. This means more effort must be expended to combat this problem. In the meantime, until equipment can be improved, the most effective program to follow is one of good housekeeping.

There have been articles written in several service publications describing the present situation, and suggesting various ways to improve operating conditions and methods to reduce the casualty rate of engines. Several protective devices have been built, engineering changes accomplished and Technical Instructions written in an effort to reduce this hazard. In spite of all the efforts put forth, more engines are sent to overhaul for foreign object damage than for any other cause.



J57-P-8 engine of an F4D-1 received heavy damage to the first 5 stages of compressor when after quick-disconnect flange bolt, part no. 236417 (photo above) was ingested during turnup. The FUR states "damage occurred during morning low-power turnup on the line by Maintenance. Ducts were visually checked prior to turnup. The engine had undergone a high power test the previous evening with no irregular results. Damage noticed during start before engine reached IDLE RPM and engine immediately secured. Pre-turn-up inspections for foreign objects in and about jets require meticulousness of the highest order."

It is recommended that the following items be checked and adhered to by all operating aircraft gas turbine personnel.

1. Make a thorough check, after all maintenance is accomplished, to account for all tools and parts used or replaced.

2. Use care and caution when running an engine. Use no more power than necessary. This can reduce the suction power of the engine.

3. Better inspection procedures to determine that all inspection doors are secured and loose parts removed from the engine ducts before an engine is operated.

4. Pick up any debris found on the parking ramp, run-up area and on the runways.

5. Conduct a training program for all personnel for a good foreign object damage prevention program.

Remember, an engine saved can result in tremendous savings to the government. The benefits that are realized from one engine saved from foreign object damage are as follows:

1. Prevent one AOCE. (Aircraft out of commission for engine change.)

2. Save about $6,000 engine overhaul costs.

3. Save about $400 shipping costs.

4. Save about $500 in miscellaneous handling costs.

5. Make the engine used available for use at another time.

6. Reduce the workload at your activity by making one less engine change.

7. Reduce the paperwork at your activity by making one less engine change.

8. Reduce maintenance and supply between your activity and overhaul activity by making one less engine change.

9. Make flight safety at your activity a reality.

10. Increase the effectiveness of the in commission rate at your activity.

This applies to everyone in the armed forces, not just to the personnel writing and enforcing the SOPs but all the way down to the personnel at the flight lines. Preventive maintenance has a great potential in reducing the dollars spent for foreign object damage to turbojet engines.—*BuAer Ltr Aer-MA-61, 29 Jul 57* ●

The veteran *Beechcraft* falls prey to Murphy's Law in these two cases.

MURPHY'S LAW*

Miss-Matched Wiring

The SNB-5 was undergoing a major check. Upon plugging in external power both main landing gears collapsed.

While undergoing the major inspection, the aircraft was placed on jacks, and the landing gear cycled. The entire system functioned properly.

Before removing the jacks, the gear was manually checked "down and locked" by applying force (kicking) against the wheels in the aft (retracting) direction. This kicking apparently closed the down limit micro-switch.

The aircraft was lowered to the deck, the jacks removed, and the check continued with the removal of the actuating motor for an inspection of the gear box.

During the re-installation of the actuating motor, the electrical leads were *installed in reversed position* directing power to the up position when the gear handle was in the down position.

Prior to replacing the aircraft on jacks for recycling, to determine any binding of the actuating motor, and closed down limit micro-switch by the check crew leader for an electrician to plug an APU into the aircraft for an inspection of the lighting system.

The application of this electrical power to the aircraft, the reversal of the leads to the actuating motor, and closed down limit micro-switch resulted in the retraction of the landing gear.

The deviations from the prescribed inspection were:

1. Removal of the wing jacks prior to the completion of the landing gear check.
2. Allowing the electrician to apply electrical power to the aircraft system to conduct his portion of the inspection while the landing gear check was still in progress.

Corrective Action

► Color coding of actuating motor terminals and power leads to prevent mis-matching due to limited visibility of motor terminals when the motor is installed in the fuselage, plus re-instruction of maintenance personnel in strict adherence with inspection sequences as outlined in the applicable handbook of inspection requirements.

Check and Double-Check

An SNB-5 received a 120 hours 2nd intermediate periodic inspection and a test flight of 0.3 hours duration was flown that same day. The only discrepancy on the yellow sheet (pertinent to this accident) was that the gear unsafe warning light in the landing gear handle was inoperative. An electrician signed off the discrepancy with the words "Replaced light."

The pilots and one observer proceeded to the turn-up area and completed the pre-takeoff checklist. The tower cleared them to takeoff. As the aircraft was approaching takeoff speed the landing gear warning horn began to sound. The aircraft settled to the deck on the underside of the fuselage and the two engine nacelles. The aircraft came to rest 1140 feet after the first prop nicks on the runway. No fire or explosion occurred and the occupants evacuated the aircraft without further incident. No personnel were injured in this accident.

It is the conclusion of the aircraft accident board that the primary cause of this accident is maintenance personnel error. When the electrician replaced the landing gear switch assembly and reversed the wiring, enabling the gear to retract when the circuit was completed, he set the groundwork for this accident.

In view of the fact that the electrician inspected his own work as a qualified systems inspector it is felt that this is one of those all too frequent situations which prevents an individual from seeing his own errors. Therefore, the board recommends that all such work requiring the approval of a qualified inspector, be approved by an inspector other than the individual who completed the work. ●

* If an aircraft part can be installed incorrectly, someone will install it that way!

Letters

Loose Screw

Sir:

Page 46 of July APPROACH carried an article titled "Shorted Out" which attributes the flameout of an F9F-8 to an electrical short. Please explain how the short could cause the flameout.

Col. H. W. TAYLOR
NavAirLant

● **APPROACH erred—The cause of the flameout could not be determined according to the report. The sentence should read, "The cause of this forced landing was the presence of a loose screw in the right console of the electrical distribution box."**

Ring Flutter

Sir:

"Smooth Operating Procedure," page 19 of the June '59 issue states: "Keep 1 inch mp on the engine for every 100 rpm on letdowns whenever possible (exclusive of landings)—saves rods, bearings and reduces wing flutter." It is believed you meant ring flutter.

EAGLE EYE

● **You are correct and thanks.**

All Is Not Lost

Sir:

Sometime back an item appeared in the Weekly Summary of aircraft accidents which was called "Oops, No Plate." The following information is mentioned as a reminder that even if the letdown plates "go out the window" all is not lost. Give me 5 or 10 minutes and I'll construct the framework of one. The chart can be completed with information from ground radio (com station or tower).

From past experience in multi-engine aircraft I recall doing this (for practice purposes) with the printed material required to be in the cockpit. Enroute Supplement and low altitude chart provides:

1. Field elevation.
2. Runway length (plus 70′ or minus 30′).
3. Frequency and identification of range, leg headings.
4. Quadrant identification and power of range.
5. Runway surface type, lighting information.
6. Distance and bearing of airfield.
7. Minimum enroute altitude between radiofacility and next enroute facility (quadrant in which the airfield lies) which will normally cover a radius of 5 miles from the radio facility and will usually include destination airport.

You now have a letdown chart which has the following missing items:

1. High station altitude.
2. Low station altitude.
3. Procedure turn altitude and direction.
4. Minimum altitude (type of approach).
5. Missed approach procedure.
6. Verify letdown leg.
7. Holding pattern.

These items can be obtained from destination radio station or tower in a very short amount of time.

It is granted that a preflight verification of a complete set of Nav aids is conducive to longer life. It is also believed that the knowledge and practiced ability to accomplish the data listed above are additional insurance against possible panic caused by loss of a letdown plate, and a successful landing at your destination vice your alternate. This could be an item to include on an instrument training level.

E. J. BURLEY
LCDR, USNR

NOTE!

If you think the answer to question 5 of the FLIP QUIZ in the August APPROACH *is* wrong, you are right. The question asked above what flight level was use of the navigational facilities shown on the high altitude charts mandatory. When the answer was prepared, 270 was the level, but since then this has changed to 240.

APU Magnetizes Struts

Sir:

I read with interest the note on "Magnetic Compass Deviation," a Clipboard item appearing in the July issue of the APPROACH.

A similar experience was had by the writer when assigned as the electronics officer of VR-21.

As pointed out in the article it was felt that the main problem for radical compass deviation when raising or lowering the gear of the R6D or R5D was a result of magnetization of the nose gear strut.

We found that terminal and maintenance personnel were threading the APU cable around the nose gear strut for support of the plug where it mates to the aircraft connection. Ground personnel felt this was necessary because of a loose fit after wear and tear.

Magnetization of the nose gear strut can be easily accomplished since magnetization force is a result of ampere turns, i.e., the number of wire turns around a magnetic core. A half turn around the strut when the APU is furnishing 200 amperes or more of external power will do the job.

Our method of demagnetization was to run a "growler" up and down the strut especially in those areas found heavily magnetized. These areas can be located with a portable compass.

G. E. SCHWENTER, LCDR, USN
Avionics Officer Sherman Field

VOLUME 5 APPROACH, THE NAVAL AVIATION SAFETY REVIEW NUMBER 4

Purposes and Policies: APPROACH is published monthly and contains the most accurate information currently available on the subject of aviation accident prevention. Contents should not be construed as regulations, orders, or directives. Material extracted from Aircraft Accident Reports (OpNavs 3750-1 and 3750-10), Medical Officer's Reports (OpNav 3750-8) and Anymouse (anonymous) Reports may not be construed as incriminating under Art. 31, UCMJ. Photos: Official Navy or as credited.

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Correspondence: Contributions are welcome as are comments and criticisms. Views expressed in guest written articles are not necessarily those of the Naval Aviation Safety Center.

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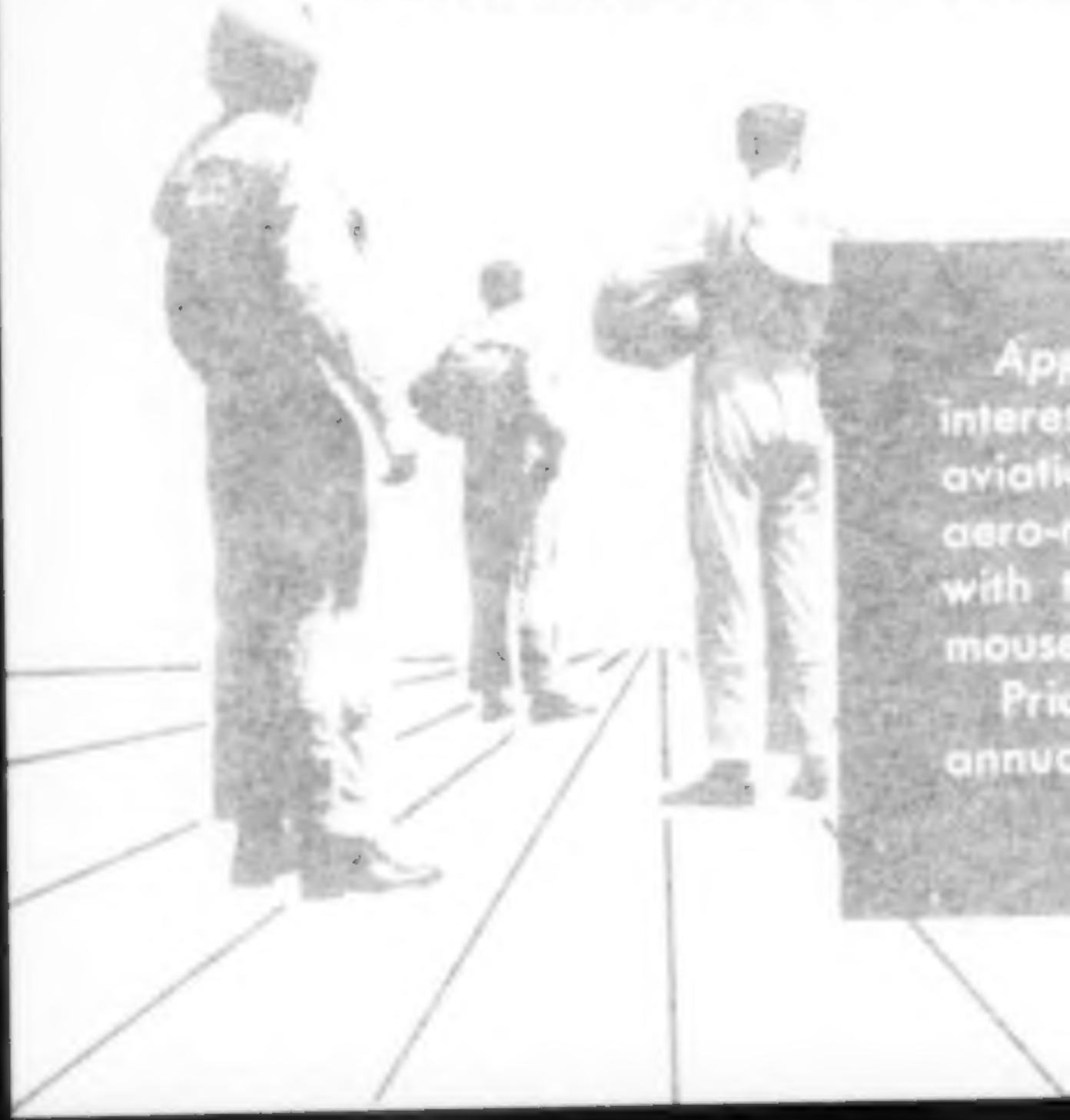

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"IT'LL BE A COLD DAY IN NORFOLK..."

1_____: "What a revoltin' development! I'm takin' this rowboat and headin' back for Bermadoo." Crew stayed aboard during freeze-in, kept careful watch on hull for signs of ice pressure.

2_____: "If ya don't like the ride, get out and walk"—one of the few times a P-boat crew had such a choice. Straw and powdered coal were suggested as means for keeping ice from crushing hull.

3_____: "And awaaaay we go-"-ignominious but safe conclusion to a flight from warm, iceless lands. Freeze-night temp was 12°, warmed up to 22° the next day.

. . . before this will happen again. Which just goes to show that swim trunks and earmuffs in the same overnight bag are not really ridiculous. In addition to expecting the expected, it's always wise to be prepared for the unexpected too.

This unfortunate P-boat got caught by unfavorable beaching conditions and had to moor in Willoughby Bay for the night . . . next morning, there she was—all that ice and no one brought the ice skates! Norfolk-based VP-56 provided the logistics via amtrac until a YSD cleared a channel and towed the ice-locked bird back to its normal habitat. The Boy Scouts have been preaching it for years — BE PREPARED!

'...for units that excel...'

"Naval aviation safety has been a continuous concern to both industry and the Navy, and North American Aviation has strived to design a high degree of operational reliability in its products . . ." This letter to the Chief of Naval Operations continued: "Safety is related to reliability of the product; however, there is also a human factor involved.

"Therefore, the Columbus Division of North American Aviation would consider it an honor to sponsor an annual award . . . to the Naval Air Unit or units that excel safetywise during an annual operation . . .

"It is North American Aviation's request that such trophies be designated the Admiral Flatley Award in honor of the late Vice Admiral James H. Flatley. This dedicated officer was continually endeavoring to assist in providing a hard-hitting, effective naval force. In this consideration, Admiral Flatley was aware of the importance of safety and the necessity therefor . . ."

The Navy gratefully accepted the offer, and announced in OpNav Instruction 3750.9 that the award will be made each fiscal year to one CVA and one CVS in recognition of outstanding achievement in accident prevention during aircraft carrier operations. Selected carriers receive temporary custody of the plaque, and permanent custody of a miniature replica. This is the first year of the award, and because of this special award, carriers will no longer compete for the annual CNO Safety Award.

In a message concerning the Admiral Flatley Memorial Award the Chief of Naval Operations, Admiral Arleigh Burke, noted that "in addition to savings in lives, equipment and funds the accident reduction pays off in terms of increased readiness to do the Navy's job. The award is deserved recognition for the sterling efforts of all hands in setting a magnificent standard . . ."

1959
USS RANGER
CVA 61

1959
USS ANTIETAM
CVS 36